

The United States MILLER

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Chestnuts for Flour.

It is well known that the chestnut was much used by the ancient Greeks and Romans as an article of food. Indeed, at one time the Arcadians subsisted almost wholly upon this farinaceous nut. The same may be said of the peasants of some parts of Italy at the present time at certain seasons of the year. The common chestnut tree is said to have been brought from Asia Minor to Sardinia, and from there it has spread over the whole of Southern Europe. It existed for centuries in Tuscany, where at one time nearly every hill and mountain side was covered with its verdure. The number of trees in Tuscany and Lucca is estimated at several millions, and the nut and wood have done more to maintain the population of some of these districts than any other production; indeed in some places wheat, flour and corn meal are entirely superseded by the chestnut flour, which is very nourishing, and much cheaper as an article of food. This tree grows to the height of 60 or 70 feet, and attains full maturity at the age of 60 years. Its vitality and productiveness, however, last for more than a hundred years. In many parts of Tuscany it is cultivated largely, and is always raised from the seed or nut. The large variety of Spanish chestnut is cultivated by grafting on the young trees. The chestnut flourishes in a light, fertile, deep soil, but thrives on the sides of mountains facing the south and west. The chestnut is composed of starch, a glutinous substance analogous to that of the cereals, and sugar. Dr. Guerazzi, in experiments narrated by him, was able to extract the sugar without altering the farinaceous or nutritious part of the nut. After gathering—which should be done by picking up those that have fallen, and not beating the tree,—the nuts are deposited in huts, in the upper part of which deep trays are constructed on which the chestnuts are placed to the depth of six inches. In these huts slow fires are kept up, with the use of green wood, until the nuts become hard and dry. In this condition they may be kept for years. They are, however, more generally carried to the mill, where they are ground into flour in the same manner as corn or wheat. From this chestnut flour various preparations are made, such as *polenta* (a kind of pudding like our so-called hasty puddings of Indian meal), and various sorts of cakes, fritters, and even a heavy kind of bread. These various ways of cooking the chestnut flour are known under the popular names of *necci*, *pattoni*, *castagnacci*, *cialdi*, *frutelli*, etc., and the food so made is sweet and agreeable to the taste, and healthy. The country people cook the chestnuts in water, and make use of the water as a drink for chest complaints, colds and dry coughs, and in most cases it has proved very beneficial. The food product of the chestnut which is most in favor, is the *polenta*, made by simply boiling the chestnut flour in water for ten or fifteen minutes, with a little salt to flavor it, taking care to keep up a constant movement of the paste, and clearing the edges of the cooking utensil, so that no part becomes burnt. It is eaten with cream, butter, ham, etc., and is most healthy and nutritious. The food called *necci* is composed of flour formed into a cake, and is made by first mixing the flour with cold water, and then making cakes piled one upon the other, and separated by chestnut leaves, pressed for the purpose, and moistened by water. The whole mass is cooked over a hot fire, and the cakes are taken off one by one, when the leaves are almost burnt. The cakes are eaten with buttermilk, cheese, bologna sausages and meat. The chestnut flour can be preserved sweet and in good condition for two years in the same manner as wheat flour, but a round chest of chestnut wood is preferable, which should be kept in a fresh, dry place. The flour must be pressed into the receptacle as firmly as possible, and then covered with chestnut husks. It may

then be preserved for two years, and is exceedingly agreeable to the taste, and, though less nutritious, is much cheaper than wheat flour. It is certainly a fact that in those regions where the inhabitants live almost entirely on the chestnut, they are of better appearance, more healthy, and not less strong than those people who live on what with us is considered more wholesome and nutritious food.

Professor Church has made the following analysis of the flour: Moisture, 14.0; oil, or fat, 3.0; proteids, 8.5; starch, 20.2; dextrine and soluble starch, 22.9; sugar, 17.5; cellulose, etc., 3.3; ash, 2.6; total, 100.0.

The cakes were found to contain only 6.7 per cent of proteids, with 3.4 per cent of flour. The large amount of dextrine is due to the high temperature to which the chestnuts are subjected in the process of drying. Prof. Church thinks that chestnut flour ought to be of easy digestibility and a suitable children's food, considering that it contains over 40 per cent of nutritious matter, soluble in pure water.—*The Farmer, London.*

Cameo-Cutting.

MICROSCOPIC DEXTERITY OF THE WORKMAN.

Cameo-cutting is one of the most profitable arts to engage in. There are but few cutters and there is a steady demand for all they can produce. The cutters are very secretive and greatly dislike to talk about their work. Most of the cameos are produced from sea shells. A visit to a cameo-cutter's workshop found him seated at a table covered with tools, varying from a strong triangular-pointed steel instrument, to the most delicate pointed bits of steel wire fastened in handles. Very fine files and knitting needles, set in wooden grips and ground to infinitesimal points, figured in the lot. On a pad of leather, before the cameo-cutter, was a block of wood just big enough to be grasped with his hand, and cemented to the middle of it was an oval object that looked like a piece of alabaster, just big enough to make a seal for the finger of a man who did not object to wearing large rings. Upon this the artist was just finishing a copy, with a pencil pointed to needle fineness, of a photograph in profile of a gentleman, which was leaned against a little photograph easel before him.

Having finished the outline, he laid his pencil by, and taking up a fine wire tool he scratched the pencil mark around with it. Then he took a darning-needle with a sharp point and scratched the line deeper. He worked with a magnifying glass at his eye, and stopped continually to inspect the progress of his work with critical minuteness. Then he went at it again, working slowly, scratching over the same line again and again, and always examining after each scratch. He changed his tools as he went on, and from the darning-needle descended to a trifling little fragment of steel wire, not as thick as an ordinary sewing-needle, set in a slender handle. With this he scratched and rescratched, until the lines he had drawn with his pencil had quite vanished, and a thin, fine streak of a dark color had marked the outline of the head he had been tracing his way around. Next he took one of his burin-like tools, and commenced again. This time he worked on the outside of the outline, cutting and scraping at the surface until the white turned gray, then brown and, finally vanished, leaving the face in relief, surrounded by a black ground; that is, the portrait remained intact in the white substance which formed the outer layer of the cameo, while it had been cut away around it to the lower or dark layer.

The portrait or figure is then modulated upon its surface until it assumes the roundness of nature. The edges are left square to the dark ground. This is necessary, as, if they are gradually rounded down, the outline becomes undefined toward its juncture with the

relieving surface, owing to the white of the raised portion being partially transparent, and permitting the dark to show through when it is thinned down. Care is taken to finish this dark surface as much as possible with the cutting tools, and so separate the white from it as to leave it smooth and unscratched. A final polish is given it, however, with putty powder, applied dry with a stiff brush, but the utmost care is necessary in this operation, as the slightest slip will ruin the work. This ends the cameo cutter's work, the mounting being the jeweler's work. The cameos sell unmounted for about \$25 apiece.

Italy is the home of cameo-cutting, and the finest works of art in that line are still turned out there. Genoa and Rome are the centers of production. There is a colony of several thousand cameo-cutters in Paris who produce very good work. The cameos made abroad are, as a rule, fanciful works, copies of statues, mythological figures and the like. The shells used in cameo-cutting are of several sorts, but all are ordinary seashells or conchs. Some come from the East and others from the West Indies. Many are imported, as there is commonly only enough material available in each one for a single cameo. These shells all have a white surface, but the inner layer is red, black and dark claret in color, according to the species. The pieces to be used by the artists are sawed from the shells and shaped into the square or oval form required on a grindstone. Then they are ready for the artist.

A REMINISCENCE OF CHRISTMAS.—A sad story is told of twelve young men, who formed a sort of club, and agreed to meet once a year and dine together in a certain room. No one was ever to be admitted to the annual gathering save the original members, nor was the number ever to be made up by fresh elections as they died off or disappeared. The story goes on to tell how joyously the feasts were held for the first few years, as the young men rose to distinction, or married and settled into happy life; and then, after a time, how there came to be a vacant chair; and a health drunk in silence to the one who would never take his place there again. As years rolled on another and another seat was empty. The men who survived grew old, and clasped each other's hands mournfully as they sat scattered round the long table. It was always the same room, the same lights, and wine, and flowers; but the faces around it were withered and changed. There came a year when only two old men sat down together and named over their trembling glasses all the brothers who once occupied the empty places beside them. And then there was one anniversary more. The people in whose house the club had so long held its meetings laid the long table as usual, wondering whether any guest would arrive; but at the appointed hour there entered one aged man, who tottered feebly to his usual seat, and, after toying a little with the food before him, lapsed into stillness and was left alone. When the room was entered again, some hours later, the old man was dead.—*European Mail.*

ONE WAY OF GETTING THE RENT.—The correspondent of a London paper says:—There are many ways of managing Irish tenants. One of my acquaintances, a landlord in the Sister Isle, summoned his people to pay, and arranged for them to come into his room singly. The first to appear refused anything beyond Griffith's valuation, and was asked to step into another room, where he was locked in. The next man that entered, seeing a lot of money on the table, imagined that his predecessor had paid the full rent, and consequently paid up too, being taken in turn to another part of the house and there supplied with plenty of whisky, the immediate result being that all the tenants paid up properly, and were finally dismissed to their homes, without any unpleasantness.

Things Worth Knowing.

STRONG CEMENT FOR STEAM JOINTS.—Take 10 parts of white lead ground in oil, 8 parts black oxide of manganese and 1 part litharge. Reduce to a proper consistency with linseed oil and apply where needed.

HOW TO MAKE CISTERNS AND TANKS WATER-TIGHT.—Paint thickly on the inside with a mixture composed of 8 parts of melted glue, 4 parts linseed oil and then boil with litharge. In 48 hours after application it will have hardened so that the cistern or tank can be filled with water.

AN IMPROVED GLUE DRESSING FOR WOUNDS. Cabinet makers and wood workers generally are familiar with the uses of glue in dressing tool cuts and other slight wounds incident to their calling. The glue pot is always handy in their shops, and a glued rag answers as well as the best adhesive plaster. In a recent paper read before the Philadelphia Academy of Surgery, Dr. Hewson recommends the addition of acetic acid to the glue, and a little attar of roses to cover the odor of the glue and the acid. This compound spread on paper or muslin makes, he says, a good substitute for adhesive plaster for surgical use. It is easily and quickly prepared, simply by putting into a vessel of boiling water, a bottle containing one part of glue to four, by measure, of the acid, and letting the bottle remain in this bath until the glue is fully dissolved and mixed with the acid. Common glue may be used and official acetic acid, to be had at any drug store. The mixture should be kept in a wide mouthed bottle, well stoppered by a long cork, which can always be removed by heating the neck of the bottle. Care should be taken to keep the mouth of the bottle clean by wiping it well with a cloth dipped in hot water. A bottle of this cheap and easily prepared dressing would be a good thing to have at home as well as at a workshop.

PATENT SELF-RAISING FLOUR.—Take 100 pounds kilndried flour, add 10½ ounces tartaric acid. Mix well. After 2 or 3 days add 12 ounces bicarbonate of soda, ½ pound white crushed sugar and 1½ pounds of salt. Mix and pass through a flour dressing machine. Keep everything perfectly dry. To bake bread from this flour it is only necessary to make a dough by adding milk or water and put in the oven and bake quickly.

A DEVICE which is considerably used to prevent the clogging of middlings, consists of a simple rod of wood placed inside the eye and extending to the balance rynd. The rotary motion of the rod separates the middlings and prevents clogging, the same device being equally effective if extended into the feeding spout.

COMPUTING HORSE POWER.—To get the horse power of a steam engine multiply the area of the piston by twice the length of the stroke in inches, times the number of revolutions per minute, times the mean effective pressure of steam in the cylinder in pounds, and divide the product by 33,000 which will give the horse power required. To get the actual mean effective steam pressure in the cylinder apply an indicator and take some diagrams. The horse power of a boiler is an indefinite expression, as a so-called boiler of forty horse power may be able, with good setting, good fuel and the most favorable circumstances to devote eighty horse power, while under adverse circumstances may not develop more than twenty horse power.

HOW TO CURE MUSTY FLOUR.—Mix 6½ pounds of carbonate of magnesia with 1000 pounds of flour. This will improve the flour, causing it to become more wholesome. It will make lighter and better bread than when alum is used, and it absorbs and dissipates the musty smell.

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We send out monthly a large number of sample copies of THE UNITED STATES MILLER to millers who are not subscribers. We wish them to consider the receipt of a sample copy as a cordial invitation to them to become regular subscribers. Send us One Dollar in money or stamps, and we will send THE MILLER to you for one year.

MILLERS' DIRECTORY.

All mill-furnishers, flour brokers or other parties desiring to reach the flour mill owners and millwrights of the United States and Canada, should have a copy of the above named work. It contains about 15,600 names with Post-office addresses, and in many cases (notably in Wisconsin and Minnesota) gives the number of runs of stone, sets of rollers, and kind of power used, or the capacity in barrels. A limited number of copies only have been printed. Upwards of 100 of the leading mill-furnishing houses and flour brokers in this country and several in Europe have already secured copies. Send in your orders at once. Price Five Dollars, on receipt of which Directory will be forwarded post-paid by mail. Address,

UNITED STATES MILLER,
MILWAUKEE, WIS.

The United States Consuls in various parts of the world who receive this paper, will please oblige the publishers and manufacturers advertising therein, by placing it in their offices where it can be seen by those parties seeking such information as it may contain. We shall be highly gratified to receive communications for publication from Consuls or Consular Agents everywhere, and we believe that such letters will be read with interest, and will be highly appreciated.

SUBSCRIBE for the UNITED STATES MILLER. Only \$1 per year.

DEALERS in milling supplies of all kinds should advertise in the UNITED STATES MILLER.

PARTIES desiring to buy or sell a mill, or get a situation in a mill, or in want of a miller or journeyman millwright, should make their wants known through the columns of the UNITED STATES MILLER.

MANUFACTURERS of any article used in a flouring mill should make use of the advertising columns of the UNITED STATES MILLER. It will pay.

We respectfully request our readers when they write to persons or firms advertising in this paper, to mention that their advertisement was seen in the UNITED STATES MILLER. You will thereby oblige not only this paper, but the advertisers.

THE Supreme Court of Iowa has decided that a millowner who builds a dam shall make it possible for fish to go up stream for spawning purposes, and that a millowner who acquires a right to water power shall protect the fishery interests of the State.

MILLERS desiring to purchase any article used in flouring mills, can find where it can be obtained by addressing parties advertising in this paper. When you write to them, be sure and mention that you saw their advertisement in the UNITED STATES MILLER.

We respectfully call the attention of readers to the new advertisement of O. L. Packard on the last page of this paper. In prices and quality of goods Mr. Packard has the reputation of giving his customers entire satisfaction. Read his advertisement and if you want anything in his line write to him.

WHILE the farmers and millers of the Great West are striving to increase their productions, the business men of the East are striving to increase their facilities for storing, handling and shipping the produce of the West and are making terminal accommodations as nearly perfect as money and skill can. A well known builder of East Boston, Mass., in a private letter informs us that he is now constructing one elevator of 500,000 and another of 600,000 bushels capacity and three large double story merchandise ware houses from 100 x 425 feet to 130 x 425 feet. All will be completed this season. Similar reports come from all our great Atlantic seaports.

GOOD NEWS FOR BREWERS.—It has been ascertained that the new cereal largely introduced in the West, especially in the state of Kansas, known as pampas rice, or as it is called in Kansas, rice-corn, is of great value to brewers. The kernel of the grain is considerably smaller than a grain of corn, it is white in color and has an average weight of sixty pounds to the measured bushel. It contains more starch and less oily matter than corn and can be malted the same as barley. It grows easily and yields a large crop. It is predicted that there will soon be a heavy demand for this new cereal from the brewers.

British Imports of Breadstuffs from America.

We certainly do not wish the British Millers any ill-luck, but there is, however, something consoling (even if it is a little selfish to feel that way) in reading the following extract from the editorial Review of the Year in *The Farmer*, a leading British agricultural and commercial paper.

The American shipments of corn during the past year have been exceedingly heavy. Of breadstuffs a quantity equal to about twenty million qrs. have been shipped, of which shipments 7,000,000 qrs., or a little over, have had a continental destination, while the remainder has reached British ports. The supplies received by us are divisible into—supplies of wheat from the Atlantic ports, 8,400,000 qrs., supplies of flour from the Atlantic ports, 3,900,000 sacks, and supplies of wheat from California, 2,000,000 qrs. The Atlantic ports shipped but slowly during January and February, but from March to June their efforts were fairly good. In July and August an extraordinary heavy exportation occurred, and the shipments since the beginning of September have ranged from 600,000 to 1,000,000 qrs. per month. The Californian shipments were heaviest in January, February and March, and again in October, November and December. They were at their lowest figure in June and July. The flour shipments of 1880 are worth noting, for they threaten the English milling trade with serious loss. During the month of December half a million sacks of American flour were imported into the United Kingdom, while the receipts of November were 480,000 sacks.

A South Australian correspondent in a letter dated 18th Nov., says that the harvest in that quarter which was just commencing, is likely to be far below that of last year, both in quantity and quality.

St. Louis Flour Statistics for 1880.

The appended table of statistics furnished by Secretary Morgan, of the Merchants' Exchange, shows the manufacture of flour, etc., by St. Louis mills in 1880. Although there is a falling off of about 200,000 barrels as compared with 1879, when it is remembered that three mills were destroyed by fire during the year, the showing is very good. The Yeager Mill burned August 17, the O'Fallon October 2, and the Pacific December 23. The Yeager alone would probably have more than made up the deficiency but for its destruction. The following is the official statement:

Name of Mill—Owners.	Capacity, 24 hours.	Flour.	Corn meal.
Anchor, Yeager Milling Co.	2,000	162,000	10,680
Park, Standard and Kauffman.	70	74,192	.....
Eagle, E. O. Standard & Co.	70	171,243	.....
Pacific, Kehler Bros.	1,100	138,953	.....
Laclede, Kehler Bros.	800	120,672	.....
Venice, Kehler Bros.	500	38,420	.....
Atlantic, Atlantic Milling Co.	1,200	286,882	.....
Empire, Empire Milling Co.	525	180,141	.....
Phoenix, Phoenix Milling Co.	475	90,542	.....
Franklin, Geo. P. Plant & Co.	425	90,490	.....
Pearl, Geo. P. Plant & Co.	300	60,750	.....
Cherry Street, F. L. Johnston & Co.	350	78,600	.....
Union Steam, Union Steam Mill Co.	400	105,640	.....
Camp Spring, Camp Spring Mill Co.	500	92,300	.....
Saxony, Saxony Mill Co.	500	81,000	.....
United States, E. Goddard & Sons Co.	450	80,685	.....
Jefferson, Sessinghaus Bros.	400	88,116	5,939
East St. Louis, Hezel Milling Co.	400	89,000	.....
Globe, N. S. Taylor & Co.	150	16,980	8,490
St. George, Henry Kalbfleisch & Co.	200	24,150	.....
Tuscan, J. L. Price & Co.	125	3,000	2,500
Carondelet, Lallemand Bros.	150	18,000	1,500
O'Fallon, O'Fallon Mill Co.	350	35,000	.....
Gamble Spring, F. Buschman.	100	839	.....
Lowell, Humpert & Co.	.....	15,730	.....
Southern, Engelke & Feiner.	.....	266,508	.....
Pearl Hominy, Wood-Maude Milling Co.	.....	243,509	.....
Mississippi Valley, Flanagan & Richardson.	.....	75,000	.....
Total	.....	2,087,625	629,856

Hominy and Grits—Southern, Engelke & Feiner, 17,410; Pearl Hominy, Wood-Maude Milling Co., 27,844. Total, 45,254.

Rye Flour—Camp Spring, Camp Spring Mill Co., 12,000; Carondelet, Lallemand Bros., 600; Gamble Spring, F. Buschman, 8,274; Lowell, Humpert & Co., 1,837. Total, 23,311.

Corn Flour—Pearl Hominy, Wood-Maude Milling Co., 1,500.—St. Louis Miller.

Foreign Trade Notes.

The condition of the Buda Pesth milling and corn trades is illustrated by the following interesting official figures:—

Imports into	BUDA PESTH.	Exports from
Jan. 4 to Nov. 30, '80.	Jan. 4 to Nov. 30, '79.	Jan. 4 to Nov. 30, '79.
Flour.....	114,632	112,976
Wheat.....	3,426,663	1,100,163
Rye.....	150,010	164,32
Barley.....	336,651	322,565
Oats.....	245,907	106,058
Maize.....	514,254	1,101,441
A centner is equal to 100 weight.		

The French are becoming alarmed at the rapid increase of imports of American flour and a movement in Marseilles shows there is apprehension of excessive imports in the future from America. A petition to the Senate, supported even by Free-traders, has been sent from Marseilles, which states that the present Custom duties favour flour more than wheat, and prays that the Senate, in discussing the entry-charges, may adjust them so as to put the French miller on an equality with the American miller—both getting wheat as cheaply as they can. It is acknowledged that the competition of American flour has taken away French trade abroad, and having suffered the loss of such foreign demand, the millers apprehend that they will be challenged in their own country (as is done already in England), and suffer defeat, without such restrictions as they ask the Senate to impose.

THE Cuban International Fair will open February 10, 1881.

MESSRS. Kosmick & Hulsekoff, flour brokers of Glasgow, have recently opened an office at 16 Mark Lane, London. This firm has also a branch house in Liverpool.

SNOWDRIFTS from 5 to 15 feet and depth were plenty in Northern England on New Year's Day.

THE new Corn Exchange Building, Mark Lane, London, is nearly completed.

New Zealand anticipates a good wheat crop this year.

The *Pall Mall Gazette* anticipates the time when the wheat producing capacity of the United States will be reduced to next to nothing by excessive overcropping and the want of manure, and deprecates the fact that the sewage of the great cities of Great Britain is allowed to so generally go to waste instead of being saved to enrich the soil.

The amount and quality of the Manitoba wheat crop for 1880 is said to have been considerably overestimated.

HERE is an item which may prove a grain of encouragement to the Grahamites and British Bread Reform League: A lady who has raised a large number of hens says that, after vainly trying the recommended remedies for lice, she had hit upon the plan of giving them

once or twice a week a large loaf made of Graham flour in which a handful of sulphur has been mixed. The hens like it, and are freed from lice and kept healthy through the season.

Halls for Public Speaking.

In large rooms, such as churches and lecturing halls, all echoes which can accompany the voice of the speaker syllable by syllable, are useful for increasing the volume of sound; but all which reach the hearers sensibly later, only produce confusion. It is found by experiment, that if a sound and its echo reach the ear within one-sixteenth of a second of each other, they seem to be one. Hence, this fraction of time is called the limit of perceptibility. Within that time an echo can travel about 70 feet more than the original sound, and yet appear to coincide with it. If an echoing wall, therefore, is within 35 feet of the speaker; each syllable and its echo will reach every hearer within the limit of perceptibility. Walls intended to aid by their echoes should be smooth, but not too solid; plaster on lath is better than plaster on brick or stone; the first echo is louder, and the reverberations less. Drapery behind the speaker deprives him of the aid of just so much echoing surface. A lecturing hall is improved by causing the wall behind the speaker to change its direction, on the right and left of the platform, at a very obtuse angle, so as to exclude the rectangular corners from the room. The voice is in this way more reinforced by reflection, and there is less resonance arising from the parallelism of opposite walls. Paneling, and any other recesses for ornamental purposes, may exist in the reflecting walls without injury, provided they are plane, and parallel to the general surface. The ceiling should not be so high that the reflection from it would be delayed beyond the limit of perceptibility. Concave surfaces, such as domes, vaults, and broad niches, should be carefully avoided, as their effect generally is to concentrate all the sounds they reflect. An equal diffusion of sound throughout the apartment, not concentration of it to particular points, is the object to be sought in the arrangement of its parts.

As to distant parts of a hall for public speaking, the more completely all echoes from them can be destroyed, the more favorable it is for distinct hearing. It is indeed true, that if a hearer is within 35 feet of a wall, however remote from the speaker, he will hear a syllable, and its echo from that wall, as one sound; but to all the audience at greater distances from the same wall, the echoes will be perceptibly retarded, and fall upon subsequent syllables, thus destroying distinctness. The distant walls should, by some means, be broken up into small portions, presenting surfaces in different directions. A gallery may aid in effecting this; and the seats of the gallery and of the lower floor may rise rapidly one behind another, so that the audience receive directly much of the sound which would otherwise go to the remote wall, and be reflected. Especially should no large and distant surfaces be parallel to nearer ones, since it is between parallel walls that prolonged reverberations occur.

A thrilling accident occurred at the American Iron Works in Pittsburg, recently. While Robert Moore was at work at his rolls, his catcher failed to seize with his tongs a bar of white-hot iron which had been placed between the rolls. The iron twisted itself thrice around the roll, forming a "collar." The catcher struck the iron, when there flew off a piece in the shape of a ring, with a stem twenty inches long running off at right angles to the circle. The band flew back and fell around Moore's head, resting on his shoulders. Quick as thought, he grabbed the long stem with his tongs and the white-hot ring with his hand, and, with steady nerve and gentle movement, lifted the fiery thing from his shoulders. His face was badly burned, and the flesh of his hand was cut to the bone. After the iron had cooled he put the ring over his head; it was but two inches larger in diameter than his head.

THE magnitude of the dairy industry in this country is shown by statistics compiled by Mr. Geo. P. Lord, of Elgin. He estimates the number of milch cows in the United States at over 13,000,000, requiring the annual product of 52,000,000 acres of land for feed, giving employment to 650,000 men, and requiring the labor of 866,000 horses. Estimating the cows at \$30 each, the horses \$80, and the land at \$30 per acre, together with \$200,000,000 for agricultural and dairy implements, and the total amount invested in the industry is \$2,219,328,000. This is more than the amount invested in banking and the commercial and manufacturing interests of the country, which is \$1,800,964,586.

Meeting of the Iowa Millers' Association.

The annual meeting of the Iowa Millers' State Association was held in the council chamber at Des Moines, Wednesday Jan. 19, President Snouffer in the chair. After the call to order the minutes of the last meeting were read and approved. The reports offered made a gratifying showing of the strength of the association and its financial condition. Several new members were admitted at this meeting. The committee on exhibits at the Cincinnati exhibition made a report showing that the Iowa exhibits were one of the best, but that the expenses were borne by the committee. A letter was read from the secretary of the National Association of British and Irish Millers, inviting the Iowa Association to send exhibits to an international exhibition of flour mill machinery to be given at London in May of this year. A vote of thanks was tendered to the Chicago & Northwestern Railroad Company, for free transportation of the Association exhibit. A subject of special importance to the Association at present, is the law requiring owners of mill-dams to put in and maintain fishways at their own expense. A committee was appointed to consider what action should be taken in the matter, with instructions to report at the evening session of the Association. Governor Gear next addressed the Association, making very flattering comments on the condition of the milling industry in the State. The business of the session was concluded by an election of officers resulting as follows: J. J. Snouffer, of Cedar Rapids, re-elected President. J. B. Jones, of Algona, re-elected Vice-president. J. H. Read, of Boone, re-elected Secretary. Executive Committee—D. B. Knight, Boone; H. Hammond, Le Grand; C. A. Bryant, Agency City. The Association then adjourned till 7 P. M.

The evening session was largely taken up in a discussion on various matters connected with the milling business. Great interest was shown by the members, and there was a lively interchange of opinion on the different subjects brought up. The following report was submitted by the committee appointed at the morning session, to consider the fishway laws:

To the Millers' State Association:

The Committee appointed to recommend a course proper to be adopted on the part of the Millers' State Association, and the owners of mill dams in the State of Iowa, in view of the action threatened under the provisions of the law relating to fish-ways now in force, beg leave to report:

That from the very limited time permitted them they have not been able to give the matter the consideration its importance deserves. They present their views, therefore, with much hesitation, and are by no means satisfied that the line of policy recommended is the best to be pursued.

The committee recommend:

1. The policy of delaying all action, judicial or otherwise, in relation to fish ways, as far as may be done, until the meeting of the next general assembly.
2. That all owners of water mills in this State be requested to meet in convention at the city of Des Moines on the first Wednesday in March, 1881, to take such steps in this relation as may to them seem necessary, and that notice of such meeting be given them by the Secretary of this Association.
3. That a committee of three be appointed by the President of this Association to aid, so far as they may, in the defense of any suit involving the constitutionality of the law relating to fish-ways that are liable to come on for hearing in the Supreme Court prior to the meeting of the next general assembly; to memorialize in this relation, in behalf of this Association, the said general assembly; to present the case of the millowners in relation to fish-ways before the proper committee

thereof, and to take such steps as they may deem necessary and proper to secure the modification or repeal of the present fish-way law.

That for the purpose of presenting to the next general assembly in the strongest manner possible the absurdity, inefficiency, impracticability and impolicy of the present law relating to fish-ways, as it is sought to be enforced by the present fish commissioner, particularly the unsuitability for the purpose intended of the designs now in the hands of the auditors of the different counties of the State, and of the great injury that would be inflicted upon the manufacturing interests of the State by compelling the construction of fish-ways in mill dams in the manner proposed, the different owners of water power in the State are requested to forward to S. D. Nichols, at Panora, Iowa, Chairman of said Committee, such information as is in their possession either by personal observation or otherwise, showing:

1. The habits of the fish native to the waters of the State, and in this connection their running time, voracity, different heights they are capable of ascending a fall of water, their liability to discover and ascend a fish-way constructed after the designs adopted.
2. The chances for increase in our lakes and rivers of fish not natives thereof.
3. The practical success which has to their knowledge heretofore attended the efforts of our present fish commissioner.
4. The value to the State of the fish commission and notably of our assistant fish commissioner.
5. The necessity of stocking with fish the lakes of this State.
6. The liability of the fish ways proposed to remain where placed in the mill-dam, and if, in consequence of the construction of such fish way, there is in their opinion any greater risk to said mill-dam, their reasons for such opinion.
7. Liability of ice in the spring freshets or floating drift to affect the dam and fish-way, etc.
8. Whether in their opinion a fish-way constructed on any plan would subserve any useful purpose in the passage of fish up the rivers of the State, and if so, upon what plan should said fish-way be constructed.
9. Reasons, if and why the State or county should bear the burdens incident to fish-ways and not the mill-owner.

S. D. NICHOLS,
I. MCBRIDE,
ABNER GRAVES,
J. W. CATHBURN,
R. T. BURNHAM,
Committee.

The following resolution of thanks was passed:

Resolved—that a vote of thanks of the Iowa State Millers' Association be tendered to Bemis Bro. & Co., bag manufacturers of St. Louis, for their generous liberality and kindly help and assistance without fee or reward—adding greatly to the success of the Iowa display at Cincinnati.

The association then adjourned to the first Wednesday in March, 1881, at Des Moines.

Yeast.

The yeast plant is now universally admitted to be a fungus growing and feeding on decaying organic matter, and is met with all over the globe. Nature seems indeed to have very carefully provided for its universal diffusion. The mildew which forms on the surface of yeast is really the fruit, the spores of which, it has been calculated, are but one-sixth of the diameter of the pollen-dust of the fir tree, showers of which have been sometimes met with hundreds of miles out at sea. When the yeast plant comes to maturity, therefore, and throws off its spores, they are very likely to travel over a great part of the earth's surface before settling. The propagation of the plant by the budding process just alluded to is very curious. A single cell will put forth one, or sometimes two tiny projections, which presently become complete cells, capable themselves of multiplying in the same manner, and thus in a few hours, under favorable circumstances, a portion of yeast introduced into a saccharine fluid will increase its volume to

five or six times its original dimensions. Scientific men have made a distinction between surface yeast and sediment yeast—surface yeast being, they tell us, propagated by buds, and sediment yeast by spores. Beer yeast, at any rate has been thus divided. There is, however, very little, if any difference in the cells of the two kinds, and sedimentary yeast appears to be only a fungus developed at a lower temperature than surface yeast, into which, as a matter of fact, it is readily converted by a rise of temperature. The reason of one kind appearing as a sediment and the other a surface growth is said to be attributable to a difference in the evolution of carbonic acid gas, the rapid generation of which keeps one "variety" of yeast at the surface, while the want of the buoyancy imparted by this generation of gas is the cause of the other kind remaining as a sediment. It seems, in fact, to be not a difference of kind, but of condition.

It is the rapid generation of carbonic acid gas which has given yeast its great value as a substitute for the ancient "leaven" in the making of bread, which is still used in many parts of the continent in the manufacture of black bread. Leaven is simply sour dough—dough that has been over-fermented, and which has the power of imparting its own fermentation to any fresh batch. In this case, also, the fermentation is produced by a fungus, the growth of which is attended by the evolution of carbonic acid gas. This permeates the whole mass with bubbles, which puff up the solid dough into an agglomeration of cells, thus imparting to it what we call lightness, and which within the past few years science has endeavored to accomplish in a more direct manner by "aerating with the gas chemically manufactured. Whether in bread or an infusion of malt, however, the growth of the yeast plant is the same. The tiny vesicles of the yeast are nourished by appropriating the sugar in the fluid, or, more correctly, by decomposing the sugar. This decomposition, in some way which, so far as we are aware, is still a mystery to scientific men, produces a similar process throughout the fluid in which the yeast is operating. Whether this process, which is neither more or less than fermentation, is caused by the action of the yeast, or whether the action of the yeast is caused by the fermentation of the liquor, is a point on which a good deal of discussion has been held. Some have maintained that one is simply the accompaniment of the other, and that the two things do not stand to each other in the relation of cause and effect. It is now very generally considered that fermentation is initiated by the yeast, though it is not, we believe, a point that can be considered settled beyond dispute. As is very well known, an outcome of the process of fermentation set agoing by the yeast is alcohol. This is produced in the bread that has been "raised" by yeast just as it is in the infusion of malt or the grape juice, and it was computed by Dr. Odling a few years ago that no less than 300,000 gallons of spirit were annually generated by the manufacture of bread in London. All this escaped into the atmosphere, and some forty or fifty years ago a company was actually formed for carrying out a process of bread-baking by which this waste of spirit might be avoided. They proposed making their profit by catching this 300,000 gallons of spirit, or the proportion of it corresponding to the amount of bread they made. It need hardly be said it was an utter failure. The promoters sunk a great deal of money in their preparations, but they were unable to catch their volatile profit, and in the attempt to do so they spoiled the bread.

The baker's oven puts an end to the action of the yeast by simply killing the plant, just as it would kill any other plant. It cannot survive a temperature of more than about 212 degrees—the temperature of water boiling in an open vessel. The yeast fungus may, however, be dried in a moderate temperature, or it may be desiccated by pressure, and its vitality would be arrested. The plant may thus be kept for a long time, and hence it is that "German yeast" has found such a market in this country. We have no statistics at hand for the present time, but about fifteen years ago it was computed that from the large breweries of the continent nearly 6,000 tons of dried yeast were annually imported into this country, and consumed by our bakers. At the present time the quantity is probably far greater. At the same time it is a curious fact that large quantities of yeast are bought up from our own brewers and exported in a compressed form to the continent, whence it probably returns in various forms of "baking powders," as well as in the shape of "German yeast." If the yeast trade is to revive in this country this fact will probably commend itself to the serious attention of English capitalists. —*Brewers' Guardian (London).*

MILWAUKEE ITEMS.—Messrs. Weisel & Vilters engine and machinery builders of this city, are furnishing the machinery for G. G. Hansen & Co's. new malt house in Milwaukee. Messrs. Smith Bros., 454 Canal St., Milwaukee, are doing all the millwright work.

Smith Bros., millwrights, are going to overhaul the flouring mills at Kewaskum, Wis.

Messrs. Smith Bros. have just completed the construction of the new grist mill at Hale's Corners, Wis.

Those well-known, Milwaukee millwrights, Smith Bros., report business driving, and their shops crowded with work.

MINNEAPOLIS ITEMS.—The Phoenix mill with its new roller mills has started up.

The owners of the Crown roller mill contemplate putting in an engine for use in case of low water.

Low water and floating ice have worried the millers considerably this winter.

The Arctic mill is shut up and it is probable that it will not be started up again until re-modeled.

Work on the old Pillsbury mill is being pushed rapidly. It will when ready to run have a capacity of 600 barrels per day, instead of 800 as heretofore stated.

Mr. H. J. Russell, a miller in the Standard mills, recently met with a serious accident. While adjusting a set screw on a roller mill his hand and arm became entangled in the pulley, breaking his arm in three places, and also giving him several severe cuts on the head. His physician says he will recover without losing his arm.

A portion of the old tunnel on the east side, at Minneapolis, recently caved in. The damage can soon be repaired at no very great expense.



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E. HARRISON CAWKER, EDITOR.

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MILWAUKEE, FEBRUARY, 1881.

THERE are 22 grain elevators in Chicago with a total storage capacity of 19,040,000 bushels.

EX PRESIDENT GRANT has accepted the office of president of the 1883 World's Fair Commission.

THE Report of the Millers National Insurance Company, Jan. 1, 1881, shows a surplus over all liabilities of \$468,700.94.

LOSSES BY FIRE.—The total losses by fire in the United States and Canada in the year 1880 were \$76,513,100. Losses for 1879 were \$81,862,700; in 1878, \$70,266,400 and for 1877 they were \$97,526,800.

A LARGE deposit of kaolin has been discovered near Bremond, Texas, and a porcelain factory will soon be at work in New Orleans which will use it. The proprietor, Mr. Surgi, before learning of this Texas kaolin, intended to import it from Europe. Porcelain rollers may yet be made in the United States.

MILLERS' MUTUAL INSURANCE.—Minnesota millers feel confident that they will secure the legislation necessary to enable them to establish a mutual fire insurance company during the present session of the Minnesota legislature. There is, however, a good deal of opposition to the proposed legislation.

MESSRS. HOWES, Babcock & Ewell, manufacturers of smut and separating machinery, of Silver Creek, N. Y., have a business house at 16 Mark Lane, London, England, and are represented by Thomas Tyson at Melbourne, Victoria, Australia, who is general agent for the Australian Colonies and New Zealand.

A NEW GERMAN INVENTION.—Mr. P. Schneider, a prominent milling engineer and solicitor of patents, in Berlin, Germany, has recently invented a system of ventilation and exhaust for flour mills, and the machinery therein which in effect does away with all suction or blast fans for milling machines. It is probable that some American firm will soon take hold of the invention and bring it prominently before the millers and other manufacturers in this country now using fans and blowers.

FLOATING GRAIN MILLS ON THE DANUBE.—A correspondent, describing a trip down the Danube in Austria, says: "The floating grain mills on the Danube are its most curious feature. Fancy two canal boats moored parallel to each other in mid-river, about fifteen or twenty feet apart, and supporting between them the crank of a gigantic mill-wheel, turned by the current of the stream. Fancy, moreover, the sides of one of these boats carried up one story higher than the other, then roofed over a la Noah's ark, with windows and doors as headed, and you will have a fair idea of these Danube grain mills, some 4,000 to 5,500 of which, in groups of 10 or 12 together, are scattered along this watery highway, all the way from Vienna to Belgrave. Each mill is inscribed with its owner's name."

GOOD SEED WHEAT.—If millers have good wheat to operate upon they can make good flour with less skill, trouble or expense than they can if compelled to use wheat of a poor quality. The millers throughout this country can if they will, almost invariably have good, first quality wheat. This much-desired end can be obtained by the millers by using their personal influence in their respective neighborhoods with the farmers to secure and sow the very best qualities of wheat possible. Many millers are now doing this, and some even go a step further and themselves obtain the choicest wheat and furnish it to good farmers in their neighborhoods at bare cost. Probably the best spring wheat now grown is raised in some portions of Dakota and Manitoba. It is an admitted fact that the qualities of spring wheat in Wisconsin and Minnesota have of late years been rapidly deteriorating. It

appears to us that the promptest remedy would be to secure from Manitoba and Dakota seed wheat of the very best quality. The handsomest that has yet to our knowledge been shown was a variety of Scotch Fife which yielded 37 bushels per acre of plump, hard, amber colored wheat. If the millers of this Great Northwest will act individually on this subject the beneficial results will be plainly seen next harvest time.

THE Wisconsin Legislature is at present considering a bill for the prevention of the adulteration of articles for human food.

THE Northwestern Miller is authority for the statement that the Barnard and Leas Manufacturing Company, of Moline, Ill., have secured the services of Clifford H. Hall to conduct *The Grain Cleaner* and that Mr. R. James Abernethy will hereafter serve the company as a traveling salesman.

It is announced that Jay Gould and other capitalists will take steps immediately towards the construction of an air line railroad from Chicago to New York. The estimated expense for the building and equipment of the road is \$100,000,000, and it is said the amount needed will undoubtedly be all subscribed inside of thirty days.

ST. LOUIS ELEVATORS.—The grain elevator capacity of St. Louis, Mo., Jan. 1st, 1880, is as follows:

	Bushels.
St. Louis elevator.....	2,750,000
Venice elevator.....	200,000
Central elevator.....	750,000
Elevator B.....	600,000
Advance elevator.....	500,000
Total.....	4,900,000

The East St. Louis elevator has a capacity of 1,000,000 bushels, the Carondelet elevator, 750,000 and the Chicago, Burlington & Quincy R. R. elevator, 650,000 bushels. The last two named are not yet completed.

THE CHINESE TREATY.—The United States Commissioners have been successful in securing a satisfactory treaty with China. By its terms Chinese immigration is entirely under the control of this Government so far as Chinese laborers, criminals and prostitutes are concerned. The Chinese gentleman of means and leisure is free to come and go. The Treaty also provides that there shall be no traffic in opium between the United States and China. It is not probable that our Government will proceed to drive out Chinese laborers now in this country, now that they are enabled to do so by the terms of the Treaty. The Treaty has not yet been ratified by Congress, but undoubtedly will be.

MANUFACTURES IN THE SOUTH.—The increase of the number of manufactures in the Southern States during the past few years has been considerable and there is no doubt but the number will be greatly increased in the near future. The South has not only good water-power almost everywhere but has also an abundant supply of coal. It seems perfectly natural that cotton factories should loom up everywhere in that great cotton producing section, and the reports from these factories which have been already established is highly encouraging. The Negro laborer is not adapted to work in factories but is well adapted to all kinds of farm labor. The prospects of the South are certainly very favorable.

ARTIFICIAL MILLSTONES.—There is a company in the State of North Carolina that have for sometime been engaged in the manufacture of millstones. The company owns a quarry of a peculiarly hard and brittle stone, which is broken up and mixed with a native cement and formed into millstones entire, or into blocks for millstones. We have a sample of the stone in this office. The company has not advertised its business to any extent, but they claim to be kept as busy as they desire to be for the present. Thus far these artificial stones have been used principally for corn mills in various portions of the South, but where they have been used for grinding wheat for flour they are said to have given very good satisfaction.

RAILWAY BUILDING IN THE UNITED STATES. Railway building in the United States was prosecuted most vigorously during the year 1880. A leading authority (*The Railway Age*) estimates the number of miles of new track laid during 1880 at 7500 at a cost of \$72,000,000. New track was laid in every state but Mississippi and in all the territories but Idaho, Wyoming and the Indian Territory. It was predicted that not less than 10,000 miles of new railroad will be built and

equipped during 1881. There are now in operation in the United States 93,704 miles of railroad.

Personal.

Messrs. Munn & Co., publishers of the *Scientific American*, have recently purchased the *Scientific News* of Messrs. S. H. Wales & Son, and will hereafter publish it monthly. It will contain 32 pages each month, and the subscription price is \$1.50 per year.

Albert Hoppin, Esq., editor of the *Northwestern Miller*, called during the early part of January and wished us a Happy New Year.

Married, January 5th, 1881, Mr. Henry Sanderson to Miss Alice Kane, both of Milwaukee. The bridegroom is the son of Hon. Edward Sanderson, President of the Wisconsin Millers Association, and one of the prominent Milwaukee millers. We wish the young couple unlimited happiness and prosperity.

Married, January 26, 1881, at the residence of Mr. and Mrs. E. B. Simpson, of Milwaukee, Mr. Lewis Rodgers Hurd to Miss Fannie Susan Simpson. We extend our hearty congratulations to the young couple and wish them a long and prosperous life. Mr. Hurd has long been known to the milling trade as an able representative of the mill-building works of Messrs. E. P. Allis & Co. The bride is the daughter of a well known lumber broker and commission merchant.

New Publications.

Among the many beautiful papers which come to our notice *The Paper World* of Holyoke, Mass. is one of the very handsomest. It is ably edited and its articles on men whose reputations have been made by printers ink is an interesting feature. To those interested in the paper trade the *Paper World* is of great value.

Harpers Weekly.—Harper Bros., New York, publishers, is now in its thirtieth volume and is as full of interest as ever before to the reading public. Nast's caricatures and sketches are always good and are well appreciated by the hundreds of thousands of readers of *Harper's Weekly*.

The Ladies Floral Cabinet published by Adams & Bishop, 46 Beekman St., New York at \$1.25 per year is one of the handsomest illustrated journals of household art flowers and home literature in America, and is a great favorite with the ladies everywhere.

Romola, a novel by the late George Eliot has just been issued in a handy and beautiful form, cloth binding at the low price of 35 cents per copy by the American Book Exchange, Tribune Building, New York.

The Holyoke Hydrodynamic Experiments during 1879-80 is a valuable report in pamphlet form of the turbine water wheel tests made at Holyoke, Mass., by the Holyoke Waterpower Co.

Harper's Magazine for February comes to hand brim full of good and interesting things. *The Gospel History of Italian Paintings*, *The English Lakes and their Genii*, *Pottery in the United States*; *The Old New York Volunteer Fire Department*, and other articles, are handsomely illustrated. The poems, stories, and the *Drawer* are up to the usual standard. Harper Bros. now publish their magazine in London, simultaneously with their American edition.

Scribner's Monthly Illustrated Magazine, Scribner & Co., publishers, New York. The February number of this popular magazine contains the following well chosen and handsomely illustrated articles: *An Old Virginia Town*; *John La Farge*; *Foreign Actors on the American Stage*; *Thackeray's Relations to English Society*; *Peter the Great as Ruler and Reformer*; *Garrison Life at Governor's Island*. There are also many poems, scientific sketches and highly interesting narratives. This excellent magazine is now in its twenty-first volume, and should be a regular visitor to the library of every family capable of enjoying choice literature.

THE YIELD OF WHEAT.—To test the bearing qualities of the leading varieties of wheat, the Superintendent of the Ohio Agricultural College Farm sold seed wheat to farmers in various parts of Ohio and other States, requesting report of yield from each. The results are shown in the following comparison: Fultz, 24 reports average 25½ bushels; Clawson, 10 reports average 23½ bushels; Silver Chaff, 15 reports average 26½ bushels; Velvet Chaff, 11 reports average 26 bushels; Gold Medal, 12 reports average 21½ bushels; Sandomicka, 7 reports average 24½ bushels.

The Wheat Crop of 1880.

OFFICIAL REPORT.

The Department of Agriculture in its report for 1880, just issued, makes this general exhibit:

The yield of wheat, as returned us by our correspondents in November, indicated an average yield for the whole country of 13.8 bushels per acre, which is somewhat less than last year, and slightly more than 1878. The acreage in this cereal was increased nearly 11 per cent, and was estimated at 36,037,950 acres for this year, giving a total crop of 480,849,000 bushels against 448,756,000 in 1879. With the increase of population and area to be sown, added to the increase in consumption caused by prosperity in all sections of our country, it is safe to estimate the home consumption of this cereal to be 275,000,000 for the year, thus leaving a surplus for exports of 205,000,000 bushels.

The price per bushel, as returned us by the producer is \$0.96, making a total value of \$460,000,000 against \$497,000,000 in 1879 at the same date.

The following table, showing the estimate of area, quantity, value and export since ten years may be found of interest:

TABLE OF WHEAT CROP AND VALUE SINCE 1870.

YEAR.	Acreage.	Yield per acre.	Total product.	Price per bushel.	Total value of product.
		Bushels.			
1871.....	19,943,893	11.5	229,722,400	\$1 25.8	\$290,411,820
1872.....	20,858,359	11.9	249,097,100	1 24.0	310,180,375
1873.....	22,171,678	12.7	281,254,700	1 15.0	323,594,805
1874.....	24,967,027	12.3	307,100,200	0 94.1	291,107,895
1875.....	26,381,512	11.0	291,022,600	1 00.0	291,022,600
1876.....	27,027,021	10.4	281,356,800	1 03.7	291,356,800
1877.....	28,277,516	13.9	393,194,146	1 08.2	393,194,146
1878.....	32,108,500	13.1	420,752,400	0 77.2	326,346,424
1879.....	31,545,890	13.7	432,611,181	1 10.2	477,008,803
1880.....	36,037,950	13.3	480,849,700	0 95.8	460,597,000

WINTER WHEAT.

The preliminary investigation, made December 1st, regarding the area and condition of winter-sown wheat shows an increase in the acreage since that of last fall amounting to nearly 4 per cent. The largest increase is in the State of Kansas, which is reported as being 13 per cent; in Ohio the increase is 3, and in Maryland and Missouri it is 2. Illinois and Pennsylvania, both large winter wheat-growing States, report only an increase in area of 1 per cent each. Indiana, Tennessee, Virginia and New York, each of which plants large areas in the crop, all report a decline, more or less; the principal cause for the decline being stated to be drought at seeding time.

As to corn, the report says that the returns do not materially change the estimate of corn made in November, and the favorable and unfavorable conditions then noted in the different sections of the country have been confirmed. The early coming of snow, and the unprecedented, for many years, rainfall in the West and Southwest was injurious to much corn still left standing in the field. The average yield of the whole country is almost identical with that of 1879, and is 20.2 bushels per acre. This yield gives a product of 1,347,535,900 bushels, a slight decline from the total product of last year, which is caused by a decrease in the area planted. The average price, as returned to us by the farmers, is 40.1 cents per bushel against 37.5 in 1879. The increase of value is general all over the country. The area sown in oats was only 1 per cent more than the previous year. The yield per acre was 27.8 bushels, against 28.7 then. The total product of the country is therefore estimated to be 355,000,000 bushels, against 364,000,000 in 1879. The average price returned us is 36 cents per bushel, making a total valuation this year of \$128,000,000 against \$120,800,000 in 1879. Other and lesser crops do not materially differ from those of last year, except cotton, which is thus reported: The continuance of rain, together with very cold weather in November, will shorten to a considerable degree the estimates made early in the season; but if the increase in area is taken into consideration the loss in the States of the Mississippi Valley is more than counterbalanced, and there is prospect of somewhat more cotton than in 1879.

The following is a summary of reports made to this Department on December 1: In North Carolina 43 counties reported an average of 14 per cent more than last year; South Carolina, 18 counties reported an average of 9 per cent more; Georgia, 57 counties, an average of 5 per cent more; Florida, 14 counties average 7 per cent more; Alabama, 27 counties reporting, make an average of 12 per cent less; Mississippi, 35 counties reporting, average 17 per cent less; Louisiana, 18 counties average 15 per cent less; Texas, 65 counties average 30 per cent more; Arkansas, 32 counties average 7 per cent less; Tennessee, 23 counties average 15 per cent less.

Beau.

(Dedicated to the Modern "Heroic" School of Writers.)

HON. PONDEROUS POLYLOQUENT, LOQUITUR.

That reminds me, dear sir, of a little occurrence which happened

When I was a lad.

Ah, let me replenish your glass, sir. And if you'll permit me,

I shall be very glad

To recount it to you, for I venture to flatter myself that

It is other than bad.

You observe, at the side table there, that majestic old dandy?

Well, that sir, is Beau.

The hero who made himself famous upon that occasion,

A long time ago,

Way back in Virginia—let's see, if my memory serves me,

In the year twenty-fo'.

Twas in Albemarle County, Virginia, my father resided

Till the day that he died,

Well off in fine horses, and niggers, and arable acres,

And family pride;

Thomas Jefferson's friend; a horseman, a swordsmen, a Christian,

Was he known, far and wide.

This digression pray pardon. 'Twas here that he raised us together—

Old Beau there and me.

Though Beau was a nigger, and I was the son of his owner,

Not a little cared we;

We were simply two boys—we were friends—we were constant companions,

In work or on spree.

Well, a cousin of mine, James Tottett, from Washington city,

Came over one year

To pay me a visit—a priggish young blue-blood and churlish,

With an arrogant sneer

For our "primitive" customs, and boasting his wondrous achievements

In tobacco and beer.

From the first Beau conceived a dislike to James, "the town-tacky,"

Which he sought not to hide;

While James was accustomed to make him the butt of his banter,

And frequently tried

To goad him by taunts to a quarrel, to which the young dandy

Very seldom replied.

One Sabbath we went, with a lot of the neighboring youngsters—

Inclusive of Beau,

And of James—to the river near by, our ultimate purpose

A-swimming to go.

Walking thither James ridiculed Beau more severely than usual

(If he could have done so).

Now Beau was a wondrous musician on whistles and fiddles,

Which he made with his knife,

And the Christmas preceding my father had brought him from Richmond

A marvellous life,

To perform upon which, to his friends' and his own delectation,

Was the pride of his life.

And upon this occasion his life, from his pocket projecting,

In view of us all,

Was snatched at by James. Then they clinched.

In the tussle ensuing

Beau was rather too small;

James gave him a drubbing, and then put the life in his pocket,

Thus concluding the brawl.

We continued our journey until we arrived at the river,

Our prime destination;

Our ablutions performed, our habiliments donned, 'twas suggested

That, for more recreation,

We proceed up the stream to the "Door of the Devil," which motion

Received approbation.

This Door of the Devil was then a notorious feature

In the river had by.

Where the water dashed swirling beneath the steep bank excavated,

With a sough and a sigh;

And never again had aught swallowed down by its current

Been perceived by man's eye.

Arrived, we were gazing with wonder down at the white waters,

And with some superstition,

When, attempting to cast an unwieldy projectile into them,

James lost his position—

Falling in—in a trice sucked from sight—while we stood stark as statues,

In our helpless condition.

Great God! Not an atom of hope! Yet some one cried "Murder!"

In response to which call

Came a number of parties—among them were Beau and my father

(Beau after the brawl)

Having sulked in the rear—and despair and a sickening horror

Filled the faces of all.

No hope; for the Door of the Devil never yields up its victims,

And none is so rash

As to forfeit his life in a futile endeavor to rescue,

Nor—Hold!—like a flash,

A figure darts through us—leaps over the bank—in an instant

Disappears with a splash.

It was Beau! There's a breeze of a murmur, and then a dead silence.

He can ne'er re-appear;

This we know, even though he is one of the finest of divers

To be found far or near.

Thus we wait a full minute—another—two heads above water!

And from us a hoarse cheer.

There's a fearful suspense—a grand struggle—and Beau, with his burden,

At last is ashore;

And the men rear him, dripping and bleeding, aloft on their shoulders,

With a thunderous roar.

And my father for once is profane, as he swears, By Jehovah,

He is FREE, evermore!"

When James had recovered, he walked up to Beau, and he thanked him.

And assured him James Tottett

Was his friend from that forth, and he offered his hand, but Beau scorned it,

And muttered, "Dod rot it!"

Do you think it war you I war after?" (his hand on his pocket)—

"Twar my life, and I got it!"

T. H. ROBERTSON.

—Editor's Drawer, in Harper's Magazine for February.

The Grain and Flour Business of St. Louis.

The grain trade is one of the most valuable industries of St. Louis, and in wheat, corn, and barley there was an increase of receipts in 1880 over 1879. The receipts of wheat for the entire year was 18,439,403 bushels, against 17,093,362 bushels in 1879, an increase of 1,346,041 bushels over last year; the increase of 1880 over 1879 being over a million bushels less than the increase of 1879 and 1878. The receipts and shipments of wheat in this market, for the last ten years, were as follows:

Year.	Receipts.	Shipments.
1870.....	6,634,253	636,562
1871.....	7,311,910	1,048,532
1872.....	6,407,987	918,477
1873.....	6,185,088	1,210,386
1874.....	5,235,321	1,938,841
1875.....	7,604,265	1,462,453
1876.....	8,937,674	2,630,007
1877.....	8,274,151	2,410,190
1878.....	14,325,431	6,900,802
1879.....	17,093,362	7,302,076
1880.....	18,439,403	11,263,358

The receipts of wheat during the month of July, 1880, were unprecedented in this market, for in the two weeks of that month 1,871,885 and 1,356,167 bushels respectively came in, and the total receipts for that month amounted to 4,006,131 bushels. In the late fall and during the month of December there was a great falling off in receipts, owing to a local panic in the grain market. This lessened greatly the receipts for the year 1880.

Corn showed a very large gain for the year over 1879. The total receipts for the year just closed amounted to 21,227,157 bushels against 13,360,000 bushels for 1879, an increase of 7,866,522 bushels, being the largest gain ever made in one year. The following table will show the receipts and shipments of corn at this point for the past ten years:

Year.	Receipts.	Shipments.
1870.....	4,708,838	3,637,060
1871.....	6,030,734	4,469,849
1872.....	6,479,387	8,079,739
1873.....	7,701,187	5,260,916
1874.....	6,991,677	4,148,556
1875.....	6,710,263	3,523,974
1876.....	15,249,909	12,728,849
1877.....	11,847,771	9,309,014
1878.....	9,009,723	6,382,712
1879.....	13,360,000	8,311,005
1880.....	21,227,157	17,565,908

The receipts of oats for 1880 were 5,127,078 bushels, against 5,072,165 bushels in 1879, an increase of 124,913 bushels; total shipments of oats for 1880, 2,537,757, against 2,154,026, an increase of 383,731 bushels. Receipts of rye for 1880, 420,535 bushels, against 423,720 bushels in 1879, a decrease of 3,185 bushels; shipments, 274,978 in 1880, against 423,730 in 1879, an increase of 158,744 bushels. Total receipts of barley for 1880, 2,482,905 bushels, against 4,831,507 bushels in 1879, an increase of 651,398. In shipments there was a decrease of 106,390 bushels, which shows that the breweries consumed a very heavy amount of barley during the past year, the receipts having been so far ahead of 1879, and the shipments so much less. This indicates also a considerable increase in the amount of malt and beer brewed here, the breweries of St. Louis ranking among the largest and best in the land.

As regarding the source of supply for St. Louis, on grain, about 9,000,000 bushels of wheat were transported from the west by rail and the Missouri river; from the south, west of the Mississippi river, by rail, about 8,000,000; from the south, by lower Mississippi river boats, about 800,000 bushels, and about the same amount from the south, east of the Mississippi, by rail; from the east, by rail and the Illinois river, upwards of 3,000,000 bushels, and the remainder from the north, by rail and river and from wagons from near the city. The great bulk of the corn comes from the west by rail and the Missouri river, but the receipts from the east by rail and the Illinois river, and from the north by rail and river, are also quite heavy. The oats, rye and barley come chiefly from the west and north by rail and river. The elevator capacity of St. Louis is at present 6,850,000 bushels. This is not sufficient for the grain business of the city.

The need of more elevators and better locations has long been felt, but, from some cause or other, capitalists have been slow in the matter. This seems strange, when the grain receipts have been so heavy. But this is fast being remedied. Within the past six months some of the leading elevators have been increased in capacity, and two more are to be increased at once to the capacity of 600,000 and 1,100,000 respectively. Several new elevators are now in course of construction, and will be completed in time to handle this year's new crops. There will be three new ones in East St. Louis, with an aggregate capacity of 2,750,000 bushels. Some outside capital has been secured, and the elevator interests of St. Louis have a bright outlook. Several disastrous conflagrations during 1880 were serious drawbacks.

The flour trade of St. Louis for the year 1880 does not show much of a gain, the total receipts being 1,612,827 barrels, an increase of 5,591 barrels, the receipts of 1879 amounting to 1,607,236. Two years ago the flour trade was the largest and most valuable of any industry in the city, giving employment to upwards of 5,000 men. The product of the city mills in 1879 was 2,142,949 barrels; but for 1880 the total amount of flour manufactured here will not exceed 1,800,000 barrels, which will cause St. Louis to drop from first place in making flour. Minneapolis will probably lead St. Louis in the production for 1880, on account of the disasters which overtook our millers during the past year. Three of the largest mills were destroyed by fire, the largest being the Yeager, which had a capacity of 1,500 barrels in twenty-four hours. This was the finest mill in the whole west, with but one exception, and was the most extensive mill ever operated in St. Louis. It was burned in August, just at the very height of the flour season, and had but a short while before been stocked with new machinery. Its owners had several times previous met with losses by fire, and had had embarrassments in business, and just as they were straightened up, with an immense amount of wheat and flour on hand, a fearful conflagration swept away the handsome property which had but one week before commenced to net its owners \$1,000 per day—the only time in the history of the concern that it had begun to pay handsomely. The insurance being small, in proportion to the loss, the owners of this mill were not able to rebuild, nor could they raise the money in this great, wealthy city. The ruins of the building still stand, a blot upon the enterprise of the city. The leading spirit in the Yeager mill has gone to Illinois to engage in the same business, but not on so great a scale. Another mill of 300 barrels capacity per day burned in October, and about two weeks ago the Pacific, with a capacity of 1,000 barrels per day, also was destroyed. The latter will be rebuilt, as its owners are men of large means. Prominent millers tell me that St. Louis will not be behind this year (1881) in producing flour; that she will again keep the front rank. The twenty-three mills now in operation here produce daily about 10,000 barrels of flour. The largest now running has a capacity of 1,000 barrels per day, which will be increased at once to 1,500. Another mill will be erected by a company operating a smaller concern, with a capacity of 1,500 barrels per day. The Pacific, when rebuilt, will turn out that much. Five other mills will greatly increase, and the plans are drawn for another large mill of 1,200 barrels daily capacity. It will require these many additions to make the necessary gains to place St. Louis in the front rank. The falling behind, the past year, although due to the destructive fires which swept away one-third of the milling capacity of the city, is a sore subject with the millers and flour dealers here, especially as Missouri has ranked so high in milling products and taken premiums all over this and foreign lands.

The export business in flour for the year 1880 shows a gain of 298,104 barrels, the total shipments amounting to 3,253,139 barrels. The flour business is worth to this city about \$25,000,000.

The shipments of grain in bulk by the river route during 1880 showed a very large increase. The total amount of wheat shipped from St. Louis to New Orleans, down the Mississippi, was 5,578,240 bushels, against only 2,390,897 bushels in 1879, an increase of 3,187,343 bushels over the shipments of 1879. It is claimed by the best authorities that they would have been much larger if there had been enough boats and barges, as well as elevator capacity. This is another instance of slowness of action in this place. It was known the year before that extra boats were needed, and that

the elevator capacity was insufficient to handle the grain which comes to this market, but our capitalists were too cautious to invest their money, before they knew the grain would be on hand, or in the country barns; they are, in short, not far-sighted enough, and this is where St. Louis loses many an advantage. Now that the jetties are opened, and there is a surplus of grain on hand, they are moving slowly in the matter, and are increasing the elevator capacity as mentioned above. Jay Gould has turned his attention to this river, and will reap profits, which St. Louis capitalists should have secured. As soon as navigation is reopened forty-five of the Gould barges, which are now ready, will be put on the river. These barges are built very broad and shallow, having a fifty foot beam instead of thirty, as the others are. There is to be a large wheat elevator built at Belmont, on the river, about thirty-five miles from the south line of Arkansas.

Exporters of grain and flour tell me that during the past year the demand has been very great; that not a firm in the exporting business but could have sold twice the amount of stuff had there been proper shipping facilities from this point. Your correspondent had an interview with a prominent exporter in reference to the river route, and here is what he claims for St. Louis in this respect, which, if true, is good for this city, and may set shippers in other cities to thinking, as well as furnish a subject for discussion for the press as to the rail and river route. He said that "the grain association formed here several years ago lost \$100,000 by its constituents in testing the river route, but the humidity of the Gulf stream was clearly demonstrated, and that not a single cargo that was sent abroad via New Orleans during 1880 but has reached Europe in good shape; that England and her merchants have never appreciated why the St. Louis flour mills have stopped some of the English mills, and they have based their ideas on what could be manufactured from the No. 2 red and No. 2 white wheat obtained from Baltimore and New York, when the fact is that the class of wheat obtained from these markets has an altogether different constituent part, lacking the glutinous substance of the wheats raised in a line drawn through Virginia, Kentucky, Tennessee, southern Illinois, Missouri and southern Kansas; that the constituent parts of the wheat in the section mentioned are so different from that raised in northern Indiana, northern Ohio, Wisconsin, and Michigan, that the flour made from wheat raised in the latter section will not bring, even in the consuming markets of this country—mainly in New England—as much as the third brands of the mills in the section of country first spoken of. The consequence has been that, while the French and Belgian millers have appreciated the wheat from the first section mentioned, and, as the exports from New Orleans will show, have taken nine-tenths of the wheat exported from the country tributary to St. Louis, or in the line of country spoken of, the English millers have not had a chance to touch these wheats; and basing their ideas on the so-called No. 2 red winter of Baltimore and New York, have turned out a flour that has not given the satisfaction that the flours exported from St. Louis have. No doubt, in the future, after the classes of the wheat raised in the line first spoken of have been fully tested in the United Kingdom, they may manufacture such flour as will compete with the mills in the Virginia-Missouri-Kansas scope of territory; but as the Richmond mills, and some of the St. Louis, will find their main markets in South America, principally Brazil, it will not have the effect upon the mills of St. Louis that it might have, had they no other outlet. If the government will extend to a line of steamers from New Orleans to Brazil the same inducements that they have extended the Roach line of steamers from New York to Brazil, there is no question but that the Mississippi valley will supply to Brazil the larger part of the flour consumed in that empire, and instead of having the coffee trade of the Mississippi valley supplied by New York and Baltimore, it will come by way of New Orleans and Mobile."—St. Louis Cor. of the Chicago Times.

A WATCHMAKER at Copenhagen, of the name of Sonderberg, is reported to have made a watch which requires no winding up, inasmuch as it performs that work itself by means of an electric current. An electric magnet fixed inside the watch keeps the spring perpetually in a state of tension. All that is required to keep the watch running is to preserve the battery in proper working order, for which purpose one or two inspections in a twelvemonth are said to be sufficient.

MILLSTONES.

Facing, Hanging, and Running.

BY BRYAN CORCORAN, OF 31 MARK LANE, LONDON, E.C., ENGLAND.

[The following article was read by its author, Mr. Corcoran, before the meeting of the British and Irish Millers' Association, and the text is reproduced from THE MILLER, London, as amended by the author. For the illustrations we are indebted in part to Mr. Dunham, publisher of THE MILLER, and Mr. Corcoran, the author.]

GENTLEMEN—Mr. Alderman Hadley honored me with a request to read a paper, which I have now much pleasure in doing. After some consideration I came to the conclusion that the most important study of a miller is the true face and working of a millstone, and I think the subject is of increasing importance. Millstones are not displaced from their high position by roller mills.

The millstone can fairly afford to allow the roller mill to assist in some departments, but when the roller mill threatens the very existence of the millstone, it is time to step forward and challenge its arrogant pretensions.

"Demetrius, the silversmith, who made silver shrines for Diana," said to the craftsmen at Ephesus, whom he called together with the workmen of like occupation, "Sirs, ye know that by this craft we have our wealth."

In like manner I come before you as an advocate for the millstone, as a millstone maker of the third generation, my grandfather having started the business nearly 100 years ago. Here, thanks to the establishment of the National Association of British and Irish Millers, we have an impartial tribunal where we can each and all plead our cause, and in our technical papers, *The Miller* and the *Corn Trade Journal*, we can make our voices heard.

Many millstones in use are not suitable for the present new system. There are also a great many millstones hung in such a way that they are incapable of high-class work, and, nevertheless, all these have been doing the work of the country, proving that with superior workmanship, and greater care in details they are capable of doing far superior work. I meet some who do not believe in these niceties, others who do not understand them, and many who do not realise their importance, so I have endeavoured to treat each item so that any ordinary workman can understand it, risking repetition of some facts that are not new; and I have rather tried to include all that bears on the subject in a consecutive form, and so avoid the necessity of repeated explanation every time the subject is brought forward. I feel that if I can impart to you my own conviction I shall have raised the ground of argument from, *Are millstones better than rollers? to What is the best dress, &c., for millstones, and best condition, &c., for rollers, to accomplish any result desired by the advanced miller?* In the natural course of events, some other way than that of running the upper stone may come into use. Some persons advise running the lower stone. The want of practical belief in the necessity of carrying out the details has in many cases allowed the roller millers to gain an advantage.

I have avoided bringing forward any other subject in order to give this one more importance, and I hope an opportunity will be given me to read another paper on the large subject of Millstones at some future time.

FACING.

The face of a millstone should be a "plane" or level surface. (I leave the "dress" and "swallow" for some other opportunity.) Mr. Babbage, writing some fifty years ago, says: "If two surfaces are worked against each other, whatever may have been their figure at the commencement, there exists a tendency in them both to become portions of spheres. Either of them may become convex and the other concave, with various degrees of curvature. A plane surface is the line of separation between convexity and concavity, and is most difficult to hit; it is easier to make a good circle than a straight line."

The plane may be obtained with machinery, as in turning and planing. In obtaining it by

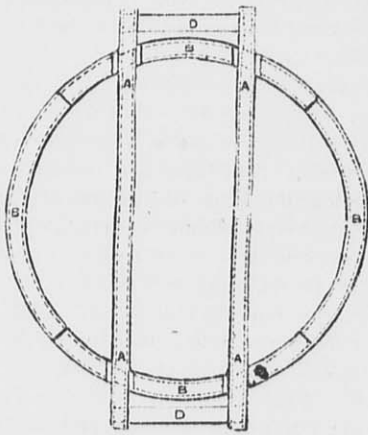
known them to do so, or certainly not without wasting their labor.

The number of beds I prefer for many good reasons is three, fig. 1, supplemented by three others as in fig. 1A. These beds indicate definitely where the plane or face will be and are themselves part of the finished face. Each bed must be made true from end to end before beginning the next, and each bed must "staff" on all beds that it crosses. My workmen have to follow this plan, and they all prefer it to any other when they once understand it.

In turning and planing, accuracy depends on the machine. Machines standing on the face of the millstone naturally follow the inaccuracies of the surface on which they rest and give bad results. The idea of the lathe may be obtained for hand work by using a trammel to staff a ring or circular bed on the face of the stone, and the idea of a planing machine is obtained with the straight beds, the intervening surface in both cases being levelled with the aid of the staff and mill-bill (mill pick) (for I do not intend to consider the relative advantage of the "diamond," "corundum," or other means).

A circular staff indicates at once the high place, as it cannot mark the low parts, and is certainly almost indispensable to a miller who wishes to keep his stones in floor or out of winding. It can only take a bearing on the part that wants taking down, so that it requires less skillful handling than a straight staff. A miller seeing it used for the first time would be surprised to find how few of the stones in the mill are true enough to stand the test. The late Mr. Potto Brown, of whom I cannot speak too much, took great pains with his millstones, and I find on June 23, 1868, a patent in the name of Potto and Bateman Brown for a circular stone staff, but it is now public property, as the patent was not carried through.

[The following is a plan of the staff shown at the meeting:]



Potto & Bateman Brown's Patent Millstone Staff.

A, A, A, A.—Two parallel straight edges built of mahogany.

B, B, B, B.—Circular staff, built in segments and layers of mahogany.

D, D.—Cross bar handles, by which the staff may be held when in use.

I read the following from the specification: "In place of forming the staff as a single straight-edge, so that it gauges the stone only in one straight line across it, we so form the staff as to gauge the stone simultaneously in several lines at the same time, and so arranged that should the stone be low on any side the staff may be sure to take a bearing on the high side only, and be prevented from falling into the hollows to color them. We prefer to construct the staff of two parallel straight edges connected together by a circle somewhat smaller in diameter than the stone. When the instrument is in use, color is applied to the straight edge, or it may be to the whole of its face, and the instrument is applied to the stone with one of its straight-edges on either side of the centre or eye. These edges (if they alone be colored, as we prefer) communicate the color to the high parts on which they chance to bear; but should it so happen that the highest parts are not beneath the edges, then the ring sustains them out of contact with the face of the stone. The form of the instrument may be to some extent varied, but it will be observed that whereas the staff heretofore employed is a straight-edge, taking its bearing along one side only, our improved staff is in principle an extended skeleton surface, which, however it may be applied, takes its bearing on the high parts of the stone only. This skeleton surface or frame is very portable and convenient in use; it is kept true without difficulty, and is easily coated with color, advantages which a complete surface would not have, and the absence of which renders a complete surface inapplicable."

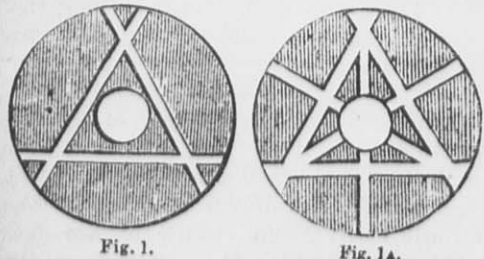


Fig. 1.

Fig. 1A.

hand with ordinary "stone-staff," however much or little of the surface has to be taken off, I think it is easiest to mark out beds or spaces across the face, just wide enough to allow free working of the stone-staff. Some men say they can do without, but I have never

LEVELLING BEDSTONE AND ADJUSTING SPINDLE.

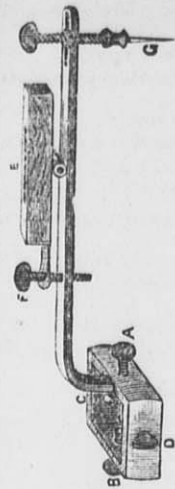


Fig. 2.—Jack-Stick with Spirit Level.

position in the tube in whatever direction the jack-stick is turned.

TO LEVEL THE BEDSTONE.

Without shifting the jack-stick, fix a quill, G, in the end, and adjust the bedstone so that the quill just touches the face all round, and the bedstone will be perfectly horizontal. See that the step and neck fit properly and are held firmly. Also take the precaution before taking the jack-stick off to see that it has not got loose on the spindle, turn it carefully round and see that the bubble still retains its stationary position, while the quill just touches the face of the bedstone over which it passes.

HANGING AND BALANCING RUNNER.

The "centre bar" should be fixed as centrally as possible (by measuring from the circumference of the stone), or when suspended on the spindle the stone will be heavier on one side than another.

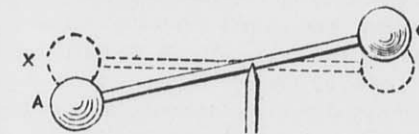


Fig. 3.—Diagram.

The balls, A, C, being of same weight, A will hang lower than C.

The stone should be suspended at a point somewhat above its centre of gravity, as it is easily balanced by adding weights to the back of the stone, but if the centre bar is fixed so that the point of suspension is below the centre of gravity, the weights for balancing need to be heavier, and below the face where there is no place for them, and the stone cannot be balanced.

An ordinary scale beam (one, for instance, about 4 ft. long, such as is generally used for weighing sacks of flour) has its knife edge at

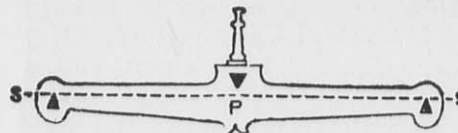


Fig. 4.—Ordinary Scale Beam.

the (pivot) fulcrum, P, about 1-16th of an inch above the line of the "knife edges" S, S (on which the scales hang); if they were on the same level the beam would oscillate too much and make the operation of weighing too slow and tedious for commercial purposes, and if the fulcrum, P, were below the line, S, S, the beam would not oscillate, for either end would remain down without recovering itself.

The stone should oscillate freely on the cockade.

Boxes are provided in the back of the runner for holding lead to adjust the balance of the stone, so that the face is horizontal while it is standing still, but it is also necessary and even more important to obtain as well a

RUNNING BALANCE.

Standing balance is an adjustment for gravitation; running balance is an adjustment for centrifugal action, caused by rotary motion.

Bodies fall by gravitation; bodies fly off from the centre of motion by centrifugal

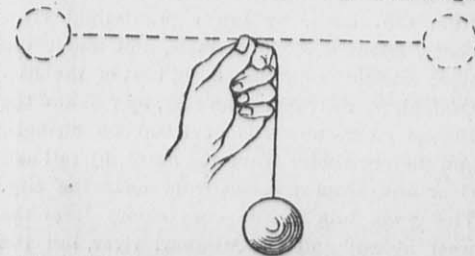


Fig. 5.—Diagram Illustrating the Running Balance.

force, and it is only by adjustment of these two antagonistic forces that the face of a millstone can be maintained in a true horizontal position while running.

It is well known that a ball attached to a string when swung round will rise till the string is nearly level. When an ordinary gov-

ernor revolves, the balls endeavor to fly from the spindle, but the arms being hinged above, the balls must rise to get away, and the greatest distance they can attain is when they are out straight, in a line level with the point of attachment. The greater the speed, the nearer they approach this line, and no speed will cause them to rise above it. A millstone that is well and evenly built and balanced for gravitation (standing balance) will run better for the care that has been expended on it, but that is not sufficient to secure a running balance, for it is practically impossible to make a millstone of perfectly even density or weight.

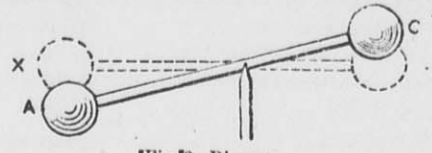


Fig. 6.—Diagram.

When rotated, the ball A will rise and C fall, and at a high speed might be on a line level with the point of suspension and return to the old position as the speed slackened. The same would be the case with balls of unequal weight at equal distance from point of suspension.

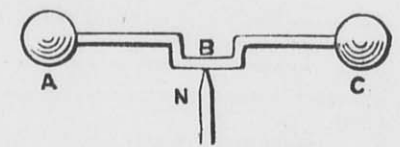


Fig. 7.—Diagram.

Equal balls, equi-distant from but above the point of suspension, when at rest would over-balance, one would be up and the other down, but both would be level when rotating fast,

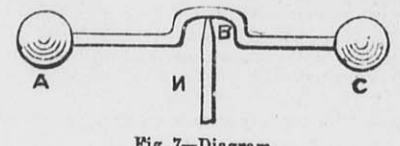


Fig. 8.—Diagram.

like a spinning top, as the balls would exert equal power to gain the line level with point of suspension, and wobble and fall again as speed slackened and rotary motion stops.

Equal balls equi-distant from, but below the point of suspension, will retain their level position when at rest or rotating at any speed.

A millstone is built of separate burrs of different densities, and the backing consists of stone chips and cement which is not so heavy as burr.

The heavy or denser burr will fall when standing still, but when running will exert greater force than the light burr towards the point of suspension and cause the light burr to dip, as at Figs. 8 and 8.

Weights may be put in the bottom of the balance boxes that will balance the stone standing, and yet the light burr will dip when running, as at Figs. 8, and 8.

The same weights may be so raised that they will exert a force downwards to the line of suspension to compensate the force of the large burr upwards, so that the stone will balance standing or running at any speed, as at Figs. 8, and 8.

Hence it follows that a stone may balance while standing still, and yet not balance while running, and in the same way a stone may balance while running at a certain speed, and not balance when standing still.

Clarke and Dunham's Patent Balance Boxes have iron weights in each, and these iron weights are filled in when necessary with lead, until the standing balance is obtained. The lids of the four boxes are then fixed on, and the weights, which are suspended by a screw, are raised or lowered with a key or socket spanner to adjust for the running balance.

The runner must be raised so as not to touch the bed-stone, and made to revolve in the ordinary way.

A quill, or thin flat splinter of wood, dipped in red-lead, inserted between the stones, and the point gradually brought in contact with the face of the runner will mark the

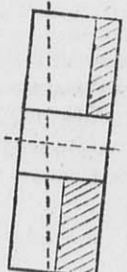


Fig. 8.—Running.



Fig. 8.—Standing.



Fig. 8.—Running.



Fig. 8.—Standing.

face of the stone where it dips, or with care and a little practice, the back of the stone may be marked with a feather, or the fingers dipped in red, or the part corresponding with the part of the face that dips and causes a hissing noise when it touches the quill. The stone must be stopped, and the weights lowered in the box A, where the back of the stone is marked or raised in the opposite box B, by turning the screw with the key to lower or raise the weights. The stone must be again revolved, the side that dips again marked, and this operation repeated until the face of the runner runs so true that no wobble can be appreciated.

The weights cannot shift, and the same balance is maintained in good order, and only requires altering with the ordinary wear and tear of the stones.

MACE AND CENTRE BAR.

The mace should grip the center bar evenly, both back and front, for should the mace M touch the center bar I, at the not at the bot-

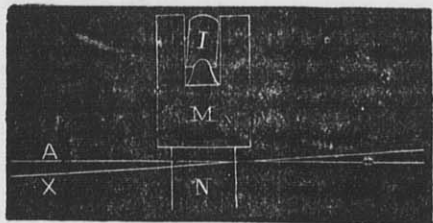


Fig. 9—Mace and Centre Bar.

tom (be the difference ever so little), it is apt to cant the face of the stone from A to X. Pieces of thin paper in the jaws of the mace will be nipped where the pressure comes when the stone is revolved, and the mace or centre bar can be filed or fitted accordingly. The driving power applied to the center bar, above the point of suspension, allows the stone to hang more freely than when gripped below the point of suspension near the mace.

PIVOT OR "COCKHEAD."

A sharp point (1, Fig. 10) is the most sensitive, but with a heavy weight like a millstone, and which has continually to be taken up and put down again, it is apt to wear or get knocked about, which alters the level of the point of suspension and destroys the balance.

If the point is made rounded (2, Fig. 10) it is subject to the same objection, or if it is flat on the top, the center bar is apt to ride, so that a half circular top (3, Fig. 10) or a perfect globe (4, Fig. 10) being more likely to be made true, appears the best, as the level of the point of suspension is the center of the sphere which is the least likely to be altered or affected by any amount of oscillation or wear.

UNIVERSAL DRIVING IRONS

Require to be carefully made, for if the four trunnions are not exactly on the same level,

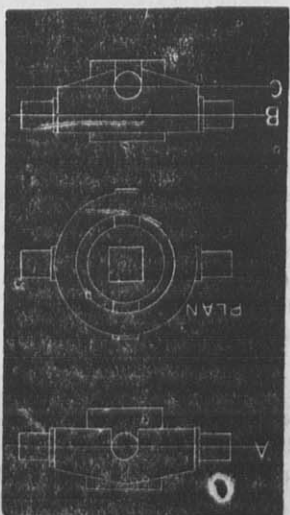


Fig. 11—Universal Driving Irons.

A, it is evident there are two points of suspension or centres of oscillation on two different levels, B, C, and it is very difficult, even if it is possible, to balance a millstone so hung.

These sorts of driving irons also are generally so near the face of the stone, or below the centre of gravity that the stone must wobble or one side drag round on the bedstone until it runs at a considerable speed.

PATENT DRIVING IRONS.

There are many patent driving irons, and some from America are guaranteed to produce a standing or running balance. I have examined a few, but I fail to understand how it is accomplished. By investigating the shape of pivots, levels of the centers of oscillation, fit of the bearings, and position where the power is applied, the weak points may be easily detected, and it should be borne in mind that increased number of bearings means increased chance of inaccuracy.

SPEED.

In England, 110 to 140 revolutions per minute is a fair average for a four foot stone. In France I find it about the same, viz: 490 meters on the circumference.

The dress of the stone must to a great extent be regulated by the speed, quality of the stone, and work desired to be done. The dress that is suitable for 110 revolutions is not likely to suit the quantity of material that would pass through the stones running at 160 revolutions per minute, whether with low, half-round, or high grinding.

RESULTS OF DEFECTS.

If the stone is not pivoted in the center, although it may be balanced so that the face runs in a true horizontal position, or if the stone is not properly balanced, there will be a side strain, causing wear on the side of the neck and toe of spindle, and undue wear of the neck and step brasses. If the stone wobbles, or one side drags on the bedstone, the stones wear unevenly, and are apt to strike fire, unless there is sufficient meal between them to protect the surface, like a fender between a steamboat and a landing stage, and some of the flour will be killed and the rest not properly ground, and the meal will be treated as though the faces were not true, causing vibration, waste of power, wear and tear or expenses for repairs, production of less flour, and of an uneven and much lower quality than the wheat is capable of yielding, and requiring finer silks and more dressing and purifying machinery than is necessary; the bran cannot be clean, and some is so finely powdered as to be very difficult of separation.

STIFF DRIVING IRONS.

Keep the stone rigid in the position in which it is set, but it requires care to adjust it each time it is put down. If set exactly horizontal, one side cannot drag on the bedstone, but unless properly balanced it will exert its power to take its own course, which would be a wobble, causing undue wear of bearings, etc., and it cannot well relieve itself should any foreign substance enter with the wheat without lifting the spindle, or the stone if it is loose.

I have heard it stated that a runner hung in the ordinary way is floated, or its weight practically diminished by about 1 cwt. for each bushel of grain ground per hour.

Mr. J. H. Carter, in his paper read before this Association in January last, in speaking of an experiment with stiff irons, says, "We anticipated at least an increase of 10 per cent of middlings over balanced stones. The result was nil, and we attribute it to so much of the weight of the stone being carried by the wheat that the runner, as it were, became unsteady on the irons. It is also more troublesome to keep in order than the balanced stones. In shelling oats and ending wheat, from which the idea originated, the operation is a light one, no appreciable pressure of the stone being required."

Under stone running requires very careful balancing, and if fixed rigidly to the spindle it works like on stiff irons. Unless the upper stone is simply held in position by its own weight there is no relief in the event of any foreign substance entering. The advantages are that the feed drops on a live instead of a dead surface, is at one distributed, cannot collect on any part of the face, and is perhaps capable of doing more work than with the upper stone running. With mills of small size any degree of pressure can be exerted, and a large feed can be passed through, which would lift the upper stone off its bearings were it to depend upon its weight only.

There are also advantages for certain classes of work. For instance, in splitting beans the object is to open, but not in any way to grind them (or a greater quantity is required to fill the bushel), and the live under-stone drives them out as soon as their size is reduced so that they cannot be nipped between the two faces again.

BOTH STONES RUNNING.

If stones run in reverse directions the speed

of each need be only (60) half that of one stone running (120), or they can go respectively at different speeds (as 40 to 80) to make the faces pass each other at the same rate; but I know of no advantage of this arrangement to compensate for the trouble of running both stones. If both stones run one way, the practical speed of the faces is only the difference of the speed of one beyond the speed of the other, causing loss of power without corresponding advantage.

VERTICAL MILLS.

Millstones working in a vertical position would not, I should think, distribute the feed equally over the surface. One runner with two faces can do double work between two bed or fixed stones, but the two faces of the runner must be exactly parallel.

CONCLUSION.

A master miller who personally tests periodically with a circular staff, jackstick and quill, that the stones are true and in running balance, need fear no competition in manufacturing, and a journeyman who can accomplish it need never want a berth.

An upper runner is the easiest to take up and put down, is easy to drive, is the best understood, and least liable to accident; and I believe that an upper stone free to oscillate, with an inclination, or rather a powerful determination to retain its perfect horizontal position against all obstacles while running at any speed, is not to be equalled.

The introduction of the purifier for middlings has so altered the work required of a millstone, from grinding to granulating, that I believe very few millers know to what extent the millstone is capable of doing the work for the present system of milling.

I refrain from saying anything on milling in the presence of so many who understand it, and I trust that I have proved that millstones can be made to run with a perfectly true adjustable parallel space between the faces, and are capable, with suitable dress, to do the work like rollers, besides that which rollers cannot do.

Mr. Smith, of Stone, Staffordshire, showed me last week a sample of spring American wheat, granulated at one operation through a pair of four-foot stones, in which there was, I should judge, less than 10 per cent of flour; the semolina and middlings were excellent, the bran not smeared but in favorable condition for subsequent treatment at the discretion of the miller, and the flour adhering was in a dry, granular state, easily removed as middlings flour. Middlings can be reduced by small millstones, or by the skirt of larger ones, with good results, and I think it will be allowed that flour may be killed by rollers.

Historical Sketches of the Corn Trade.

During the Commonwealth, a time when one would naturally suppose that society in general and trade especially were enjoying unprecedented exemption from state interference, an incident occurred at Reading showing what arbitrary measures were adopted even by the champions of liberty when circumstances rendered the adoption of despotic measures expedient. The high price of corn having alarmed the Executive, lest national distress might be fomented by political agitators into civil commotions, the Lord Protector of the Commonwealth, disguising himself as a miller, repaired to Reading with the commendable object of "bearing" the market. Having looked at some samples of wheat he offered what he considered a fair price for it. His evident disposition to buy prompted the unsuspecting farmers to increase their prices in proportion to his requirements and to meet his bids with counter offers at advanced rates. The typical miller would have struck a bargain by splitting the difference; but not so the irascible Cromwell. Swelling with indignation he adopted a more prompt but less pleasant method of closing the business. Beckoning to a couple of soldiers who had accompanied him, he ordered them to seize and hang the two astonished agriculturists, who had so outrageously presumed to place their own prices on their own corn. His orders were promptly carried out, but the effect upon the market, although very depressing in one sense of the word, was not exactly what Oliver expected. A general stampede of the farmers was the immediate result, and the following market day found very little corn and very few farmers on the road to Reading market. The scant supply naturally induced higher prices, and Oliver found the last state of that market worse than the first.

In all ages and in all countries unsuccessful efforts have been made to control the price of corn. Only a few weeks since an effort of this

sort was made in Russia, when the Government, alarmed at the high prices prevailing in St. Petersburg called upon the dealers to supply a certain quantity of corn to the public at a stated price. With commendable promptitude and pardonable trickery the dealers complied with the requisition by palming off upon the innocent public a quantity of inferior produce at the prescribed price, which was, in fact, about its market value. Indeed the folly of the edict and the ease with which it was evaded were so manifest that no attempt was made to repeat it, but a more effective and less arbitrary course pursued. A large quantity of Government stores were offered to the public at low rates, and the markets, which had been abnormally inflated by speculation, gave way to a general collapse and fall in prices. Whatever temporary benefit such measures as these may effect, they are extremely prejudicial, not only to the trade itself, but also to the general public, for although artificially reduced prices may afford for a short period relief to the many at the expense of the few, in the end the many are mulcted in costs. For not only are traders obliged to adopt a wider margin of profit to cover their losses, but speculators being wary to invest in a market that is at the mercy of the Government withdraw their capital from this branch of commerce, and leave the trade in the hands of a clique who are thereby enabled to monopolize it to the prejudice of the nation at large. Merchants dare not import, lest low prices, caused by the action of the Executive, render their ventures unprofitable, while exportation on the other hand is increased, as a sure market abroad is naturally preferred to a dubious one at home. A heavy drain upon the home supply is the consequence, with high prices and the committal of further follies by a blundering Directorate.

To encourage the cultivation of corn an act was passed in the reign of William III. allowing a bounty of 5 shil. per quarter upon all wheat exported from these shores. The impetus that was given to agriculture rendered the measure one of the most beneficial errors of legislation ever committed. The land—hitherto devoted almost entirely to pasture—was extensively tilled, and wheaten bread, until then only eaten by the upper classes, came into common use in lieu of barley, rye and oat bread that formerly formed the food of the masses. In consequence of this measure the exportation of wheat increased, in the course of half a century, from about 70,000qrs during the decade ending 1700, to almost 4,000,000qrs in that ending 1750. The benefits that have accrued fully compensate the country for the temporary inconveniences attending the measure, which, besides inducing exportation, and thereby enhancing the price of bread for our own poor, supplied a cheap loaf to the foreigner at the expense of the British taxpayer. Indeed, the sacrifice made during this period by the nation would merit the gratitude of posterity but for the disagreeable fact that the benefits that were being heaped upon generations unborn, were fully discounted by the establishment of the National Debt. Our ancestors, while conferring upon us the inestimable blessing of cheap bread, virtually borrowed the purse of posterity to effect the purchase.—*Corn Trade Journal.*

Pottery in the United States.

There are now eight hundred potteries in the United States, the total products of which supply fifty per cent of the wares annually consumed, the chief centres of the industry being Trenton, the capitol of New Jersey, and East Liverpool, in Ohio.

The former city offered peculiar attractions to the potter, both from its railways and canals connecting it with the great cities of the Union, and its nearness to mines of the raw material. West and southwest lie the coal, kaolin, spar and quartz mines of Pennsylvania, Delaware and Maryland, and eastward the fire and white clays of New Jersey.

The clays of Ohio, Missouri, and Indiana, and abundance of fuel, have built up East Liverpool, making it the ceramic centre of the West. For thirty years it has been engaged in the manufacture of the ordinary Rockingham and yellow wares, furnishing the greater portion of the two million dollars' worth annually produced in this country. It was not until 1873 that white ware of any description engaged the attention of the Liverpool potters; to-day white granites, semi-chinas and "cream color" are manufactured in fourteen thriving establishments, and one or two firms are experimenting in china.—*Miss F. E. Fryall, in Harper's Magazine for February.*

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German Millers' Association.

REPORT OF THE MILLING EXHIBITION IN CINCINNATI, AND THE POSITION OF THE MILLING TRADE IN THE STATES.

By Mr. Joseph J. van den Wyngaert, President of the German Millers' Association.

Translated from *Die Muehle*:

In opening his speech at the meeting of the German Millers' Association, reported in our October issue, Mr. Wyngaert said it was his intention, with the permission of his hearers, not alone to deliver a purely technical address, but at the same time to bring before them a few general observations and scenes from American life, which would better enable them to form an opinion of that country. From the moment he embarked on the steamer at Hamburg, he found ample food for reflection in the objects around him. The vessel in which he sailed carried nearly 1,250 emigrants and the various nationalities and condition of these people served to give him an idea of the land he was about to visit, and which was attracting these people in such numbers. There were amongst them, as might be expected, many who were going across without means, without skill, and without a strong constitution, believing that there would be sufficient openings in the United States to enable them to obtain a competency. It was mainly from this class that the ranks of the so-called loafers were recruited. Many skilled workmen, however, were to be found among the emigrants, men who were sure to be received with open arms, and always able to earn a good living. After giving particulars of the passing of the Customs' examination in New York, and specially referring to the practical arrangements and facilities offered for forwarding baggage, Mr. Wyngaert made mention of the great saving of time everywhere practiced, observable even in the formalities of meeting or leave-taking. In comparison with the German customs, where great weight is attached to the observance of such formalities, their absence was the more striking, but he soon grew accustomed to it, especially when, as a stranger, he met with such a friendly reception everywhere; and no one, he said, could be more indebted to that country than he was, for, from the moment he entered until he left the United States, he received the most cordial reception imaginable.

On his arrival in New York he was met by Mr. Kratochwill, of Ohio, who rendered him every assistance, and he had further to thank the President of the American Millers' Association, the Hon. George Bain, for sending him to New York a letter addressed to the American millers. As a consequence, he personally met with a most gratifying reception at all the mills, but in regard to information respecting their technical arrangements such was not the case at the outset. It was in New York that he first became aware how in an otherwise advanced country, where it would be thought everything was public, there existed on the part of the manufacturers a tendency to secrecy. This state of affairs, however, soon altered as far as he was concerned, when he stated that although he had come to see what the Americans had, yet he was ready to reciprocate their good offices by an exchange of ideas and by communicating his own experience, and perhaps then they might learn as much from him as he from them. This statement soon got circulated, and after that he found that all the mills, without exception, thrown wide open to him. On the present occasion he might mention that it afforded to him great pleasure to come back and state that they had not much to learn from the Americans in respect to milling, but that the Americans could learn from them (looking at the matter from a liberal point of view). There were some things in America which the Germans had not in such perfection, and it was only within the last three or four years America had commenced in reality to make any efforts towards advancement. As Mr. Oexle had remarked in his paper, the Americans were first reminded through the roller system of the necessity of entering upon a new line of action, but the impulse was also one to the method of grain production and the rapid increase in the means of transport, by which the rates of freight were lowered. Another reason to which it may be ascribed, was that the Eastern States of America began to find out that they were unable to compete with Europe in the South American markets, where the American flours were almost entirely driven out of the field.

Hungary did a large trade in that direction, and still does so in part; but in his opinion the Hungarians would be driven out of that market by the great improvements in America, because the Americans were just now begin-

ning to understand how to work their hard wheats into fine flour and because their hard wheats were every year being produced in enormously increasing quantities. Before going into these special questions he wished to refer to another picture characteristic of the American system of working, viz: the reckless way the soil was tilled, as if it were inexhaustible. It was also fearful to see the way the forests were being destroyed. He considered it fortunate for Europe that such was the case, for the day of reckoning would come, and even now the influence of the devastation of the forests were beginning to be considerably felt every year, approaching nearer and nearer to the east coast. Formerly such hurricanes and tornadoes as are now experienced were never known in many districts, because they were intercepted by the forests. The inundations every year become greater, just as was the case formerly in France, and unfortunately in Germany also—and large rivers are silting up at their outlets. This was the case with the Mississippi, not long since sea vessels of any draught were prevented entering, although the jetties as recently built, by narrowing the bed, have brought about a scouring of the mouth of the river. But this is only a temporary means of dealing with the evil, for from observations made from February to October last year, it has been ascertained that the great feeder of the Mississippi, the Missouri, now bringing down such a volume of sand that the silting up of the river will again result. It has been estimated that the bulk carried down daily would cover a square mile of ground with a bed of sand $1\frac{1}{2}$ feet deep. It is only by preserving the forests that a barrier can be opposed to such movements of earth.

The competition between the various railways is very advantageous, as it enables the exporters to send forward their goods at very low rates. Anyone who has observed the flour export trade of America has doubtless wondered why it has not taken still greater dimensions, but there are two reasons for this, firstly, because the grain can be more easily exported; and secondly, because the offals bring such low prices. In Minneapolis bran is sold at prices that would astonish us, and as a consequence the price of flour must rise in proportion. He thought that American flour would be largely imported into Germany this year to mix with the native flour. Another point not to be overlooked in considering the American competition was the question of wages, which were extremely high in the West. This of course has led the manufacturers to adopt all manner of labor-saving appliances—many of which could be introduced with great advantage in Europe.

He should not detain them long with his report about the Exhibition, for he found over there that they did not attach such importance to an exhibition as in Europe. One thing that surprised him was the fact that the Millers' Association had refused the grant of \$1,000 for establishing a millers' school, but it was quite characteristic of the people, for they say they do not require a school, as the practical instruction obtained in the mills is quite sufficient. It is very common to see and hear everything designated as the best in the world, and this often by people who had seen but little of other parts of the world. The American is proud of his work, and he congratulates him on his pride. Perhaps if they (the Germans) were a little prouder of their own work it would be more to their advantage.

The exhibition in Cincinnati was a fine one, which was greatly due to the building. The complete mills exhibited by Messrs. Simpson & Gault, Shuttleworth & Morse, and the Richmond City Mill Works, and the exhibit of rollers by Messrs. E. P. Allis & Co., of Milwaukee, and the Downton Manufacturing Company, of St. Louis. There were but few novelties shown, which would not have been the case had the German and Austro-Hungarian milling engineers exhibited. But their absence is fully accounted for by the purely prohibitive duty of 35 to 40 per cent, by which the free country of the United States excludes foreign machinery.

In no country, not even in France, is such attention paid to the millstones as in America, none but those of the very finest quality being employed. The wheat-cleaning machinery exhibited was more or less known in Europe, as the best machines were always introduced here. Cockle and seed separators were not sufficiently used, even in the best mills, and this want showed itself sometimes in the flour being specky.

Mr. Wyngaert then proceeds to give the main features of the machines exhibited, all of which have been already noticed.

As a rule, he says, he found the mills were

not kept clean inside, and it was positively dangerous to pass along between the machinery in some mills, as it was badly arranged, owing to the frequent additions that are made. The careless manner in which lights are used makes flour-mill fires more frequent in America than here, and the premiums are five times higher than in Germany. The new mills in Minneapolis, however, notably those of Messrs. Washburn, Crosby & Co., are especially distinguished for their arrangements in every respect, and it is from this quarter that Mr. Wyngaert fears the competition will be most keenly felt in future. Although the soil in certain districts is being rapidly impoverished, yet the extent of virgin soil, as yet unbroken, is so extensive that the agricultural and milling industry in Germany will have much to fear for the next fifty years at least.

The region west of Minneapolis is extremely fertile, and furnishes the mills with fine hard spring wheat. The network of canals and railways facilitate the transport of the grain in such a manner that, were it not for the comparative worthlessness of the offals, the milling industry in Europe would be easily crushed.—*The Miller, London.*

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Russia.

The gloom that has enveloped Russia since the failure of the harvest is, we are assured, daily deepening. From every part of the empire reports are arriving of agricultural distress, commercial depression, and the development of murrains and diseases. There does not seem to be a single province in the vast empire ruled by the Czar meriting the designation of "sound" or "flourishing." In European Russia the cattle disease is rife, the corn trade is menaced with destruction by the cheaper American article, the minor raw products are every one of them in a declining condition, and a failure of the harvest has become, through reckless deforesting, a matter of annual occurrence. In the Caucasus the locust invasion has yearly destroyed the crops since 1876, and promises next summer to be worse than ever; in Central Asia half the wealth of nomads has been swept away by the rigor of the last two winters; and on the Amoor the colonization scheme has failed, and the people are abandoning the country to emigrant Chinese. Bad finance, bad administration, and a bad system of agriculture are at the bottom of many of these evils, but the failure of the crops, the ravages of the corn beetle and locust, and the destruction wrought by the horse plague in Siberia, lie largely beyond the remedial powers of humanity. The financial condition of Russia to-day is so bad that it can hardly be worse, and this is attributed to the political trouble abroad. If the Eastern Question were solved, it is affirmed, things would rapidly settle down, Russia's credit would rise, and the money now spent in keeping the armaments in readiness for a second invasion of Turkey would be expended in improving the country. Hence the people argue that, as no period of peace and prosperity can commence until the eastern question is settled, the sooner a solution is hastened by Russia the better. This view of the matter is not maintained only by the military class in Russia; it is soberly put forth by the most eminent writers at Moscow, and is supported warmly by the officials, who see in it an easy way of throwing the effects of their mal-administration upon the shoulders of Turkey.—*European Mail.*

THERE are four characters in those who sit under the wise: a sponge, a funnel, a strainer and a bolt sieve. A sponge, which sucks up all; a funnel, which lets in here and lets out there; a strainer, which lets out the wine and keeps back the dregs; a bolt sieve, which lets out the pollard and keeps back the flour.—*The Talmud.*

Paper Barrels.

ANOTHER USE FOR PAPER MATERIAL.

The American Paper Barrel Company of Hartford, Ct., which has for some time been making paper barrels on a small scale, or in an experimental way, has now in operation machinery and a capacity of appointments for turning out two hundred barrels a day, with a single machine. The process of manufacture is sufficiently ingenious and interesting to make it worth our while to describe it in the pages of *The Paper World*. The pulp, made of straw, wood, rags, jute, marsh flag, or anything, in fact, from which a fibrous pulp may be made, can readily be turned into most excellent barrel material. Even jute flyings alone, when properly prepared, will make barrels of great strength and durability. The pulp is prepared in a common beating engine, similar in construction and operation to those used in ordinary paper mills, and the pulp when properly prepared is conducted to a tank on an upper floor, whence it is again conducted, by gravity, down to the barrel machine, which has for its center fixtures two barrel-shaped forms standing upright, and three or four inches apart. When the machine starts up the pulp is forced in at the bottom, passing up into the vacant space between the two barrel forms. As the machine revolves, the outer form is drawn together, contracting rapidly until the space between the two forms reaches the desired thickness of the barrel, by which time the water has all been forced out of the pulp by the immense pressure of the machine, and the pulp becomes as hard and solid as the hardest of native woods. At the turn of a thumb-screw, the inside form moves inwardly away from the pulp, and winds itself into a compact roll in the center of the machine. Then a crane is swung over the barrel and a hook attached to it, when the machine lifts it out of its place in an instant. From the machine the barrel goes to the drying-room, where it is kiln dried. The heads, made from the same material as the barrel itself, are passed under a powerful compressing press, where they receive their rimmed form, and are then fitted to the barrels as soon as they are sufficient dried to receive their hoops. An ordinary flour barrel is three-eighths of an inch thick, and weighs from seventeen to twenty pounds. The day upon which *The Paper World* looked over the establishment, an order was being filled for three hundred barrels to be used by a spice merchant in shipping spices, and barrels were being prepared for holding hot lime, for kerosene, for whiskey, for wines, for cider, for vinegar, for lard, for honey, for butter, for fruit, for flour, and in fact for almost every thing for which barrels can be used. There were also wash-tubs, bath-tubs, pails, buckets, powder kegs, etc., scattered around, all being made from the coming king of the paper trade—pulp.

The inventor of the barrel and of the barrel-making machinery has also invented a preparation of wash for use in barrels intended to hold liquids, lard or kerosene, which precludes any penetration of the barrel's contents into the barrel proper. Pieces of broken barrels were seen floating around in vessels of running water, where they had been for days, without being softened apparently or at all affected. Three and a half tons pressure has been applied to one of these barrels without affecting its ribs in the least. A flour barrel can be made for twenty-two cents as against forty cents for one of wood; an oil barrel for one dollar which in wood costs a dollar and thirty-eight cents. The Standard Oil Company is now testing these barrels with the view of adopting them for future use in its business. Barrels have been made by the American Paper Barrel Company, for samples only, of wheat straw alone, of pulp made from pine shaving alone, and also from spruce. The patents for the machines upon which these barrels are made were taken out by Mr. George W. Laraway, then of Port Byron, N. Y., on May 2d, 1876. Patents for improvements were also taken out July 30, 1878, and experiments have been making by way of perfecting the machinery until success seems to have crowned the efforts of both the paper barrel inventor and paper barrel manufacturer. Verily, great is paper, and Pulp will soon be king.

PARAFFINE AS A PROTECTION TO WOOD AND IRON.—A German scientist recommends paraffine as an efficient means of protecting wood against damp, acids and alkalis. The wood is first well dried, and then covered with a solution of one part melted paraffine in six parts petroleum, ether or bisulphide of carbon. The solvents evaporate quickly, leaving the paraffine in the pores of the wood. Great care must be taken in the use of this prepara-

tion, as paraffine, as well as petroleum, ether or bisulphide of carbon, is especially inflammable; and even the vapor of the last two mentioned substances, if mixed with air, may give rise to dangerous explosions. Paraffine melted with equal parts of linseed oil and rapeseed oil is also very useful to protect iron from rust.

The Sandwich Islands.

The *Auckland Evening Star* gives the following account of the present prosperity of the Sandwich Islands and their industries: "We recently arrived in Honolulu, and what struck us at once was the business activity of the place. This has been caused by the reciprocity treaty with the United States. Sugar plantations are springing into existence all over the group, and the amount of sugar exported to San Francisco is enormous. This ship took in during our stay of twelve hours, 700 tons, and large quantities are sent regularly by sailing vessels. The export last year was little short of 20,000 tons, and this year it is estimated to reach 30,000 tons, so great has been the growth in number and size of the plantations. A gentleman named Claus Spreckels, of San Francisco, is the greatest, and nearly the only, operator in the production of Honolulu sugars. He is pretty well liked, and has spent very large sums of money in irrigating his plantations—the only plan he could adopt with the land he had leased. He has introduced Chinese to a large extent, and with so much success that Chinese labor does nearly the whole work of the plantations. So great has been the influx of Chinese, that from 1,500 in 1876, there is now a population of nearly 12,000 in the group of Hawaiian Islands, and, by their industry and cheap living they are gradually closing all the avenues of labor to the native and European. They either buy or lease every bit of land fit for agriculture they can get hold of. All the vegetables and nearly all the fruit produced are grown by them. On the swampy lands that were really desolate marshes, they are growing rice; and they give quite a high price to lease this description of land. For one piece belonging to the Dowager Queen Emma, of 1,000 acres, near Honolulu, they pay a rental of \$500 per annum. The natives do not like the Chinese at all, and many of the white population view the influx with dismay; but what is to be done? The natives will not work; and even in all the tirades written against the Chinese the admission is made that the race possess the virtues of industry and perseverance. The King is having an extensive new palace built, which is to cost a heap of money. And while I am on houses I may say I was much pleased to see the very handsome wooden residences there are in Honolulu. Auckland has nothing to compare with them for elegance, finish, or anything else. There are in Honolulu 14,000 inhabitants, and the place has an appearance of far greater activity than Auckland. Freehold property is 'booming.' Land that could be got a few years ago at \$10 per acre is now bringing from \$100 to \$150. City property is increasing in a similar manner. About twelve months ago a corner piece, fronting the main street 90 feet, brought \$10,000."

THE increase of the population of the city of Berlin, Germany, is altogether unparalleled in the history of capitals. In 1860 its population was 528,900, while, according to the census taken recently, it now contains 1,118,630, an increase of more than two-fold in 20 years. Rapid as has been the growth of American towns, it is questionable whether anything equal to this can be shown in America. This increase in the size of Berlin is the mere singular inasmuch as Berlin possesses no natural advantages whatever. There is no doubt that Berlin owes its increase to the immense though temporary prosperity induced by a plethora of money after the wave of conquest on the crest of which the Germans swept through France.

WHERE OUR FORESTS ARE GOING.—To make shoe-pegs enough for American use consumes annually 100,000 cords of timber, and to make our lucifer matches, 300,000 cubic feet of the best pine are required every year. Lasts and boot trees take 500,000 cords of birch, beech and maple, and the handles of tools 500,000 more. The baking of our bricks consumes 2,000,000 cords of wood, or what would cover with forest about 50,000 acres of land. Telegraph poles already up represent 800,000 trees, and their annual repair consumes about 300,000 more. The ties of our railroads consume annually thirty years' growth of 75,000 acres, and to fence all our railroads would cost \$45,000,000, with a yearly expenditure of \$15,000,000 for repairs. These are some of the ways

in which American forests are going. There are others—our packing boxes, for instance, cost, in 1874, \$12,000,000, while the timber used each year in making wagons and agricultural implements is valued at more than \$100,000,000.

Lentil.

THE cultivation of lentils has received a great impetus by the discovery—or, rather, the fresh promulgation of the old discovery—that this form of pulse contains the most valuable nourishment for human beings. This is amply shown in the Egyptian agricultural returns for the present year. For the twelve months ended August 31, 1879, the total lentil crop amounted to 8,340 ardebs, a quantity somewhat larger, we believe, than the average of previous years. Egypt produced magnificent crops all round in 1879, that of cotton being the largest ever known, and lentils no doubt participated in the general prosperity. But while other crops show a considerably diminished yield in 1880, that of lentils is immeasurably the largest on record, the total outturn being 52,610 ardebs. We may, therefore, assume that the little bean—of which Egypt grows by far the finest sort—is rapidly making that progress in public estimation which its merits as an esculent deserve.

Manitoba.

Mr. Robert Machray recently delivered a lecture in Aberdeen, Scotland, entitled: "Out West; or, Five Years in Manitoba." He said that in his opinion *Winnipeg would be the metropolis of the great American Continent at the beginning of the next century*. With regard to the climate he said the average summer temperature was 85° in the shade, 100° being the extreme, and that though the winters were colder an Englishman wouldn't find it out as the atmosphere was so much drier. Insensible Englishmen! He did not say anything about 50° below zero in winter which appears to have been the average for some days lately, but spoke of the rich lands and great crops in glowing terms. He might have added that Manitoba furnishes a fine crop of blizzards also, enough of which gets over the boundary line without paying custom duties to thoroughly convince Yankees that they live far enough north for comforts sake. Really, the principal objections to living in Manitoba are its hot summers and very, very severe winters.

Immigration.

The population of the United States during the year 1880 was increased by immigration over half a million. It is impossible to accurately estimate the actual value of this great addition to our population. All brought some money, but what they brought in actual cash is but a trifle in comparison to what their labor and skill will amount to in the development of the immense resources of this country. There is room here for hundreds of millions more, and the industrious and enterprising able-bodied immigrant will be well received and furnished the opportunity to secure a competency for himself and family.

The immigration from foreign countries to the United States for the past 40 years numbers 5,273,000 persons, 534,465 of which came into this country during the year ending with June 1880. It looks as if the "old stock"—those who trace their descent from colonial families, will soon be entirely obscured. But it does not make much difference. The children of those who immigrated to this country last year when they grow up will in all probability feel and act as patriotic in the interests of our country as the descendant of the most thorough and full blooded Massachusetts colonist of the Auld Lang Syne. We do not want the criminals and paupers of Europe, but her good men and women may come and be welcome.

A Remarkable Boiler Explosion.

The first explosion of a stationary boiler in New York, for a period of five or six years, occurred about midnight, December 17, under decidedly peculiar circumstances.

It was a new vertical tubular boiler, which had been tested within a year to 150 pounds, and was registered at 100 pounds. It was set upon a fire box of quarter inch iron, in a newly constructed brick boiler house, in the rear of No. 123 West Twenty-sixth street.

The engineer claims that when he left the boiler that evening the water was within a few inches of the top of the boiler, the fire was dying out, and, as he intended to build a fresh fire in the morning, he opened the furnace door and closed the damper and ash pan. Wood for kindling the next day's fire was in the boiler house. On going away he fastened the outer gate with a chain and padlock.

About midnight the neighborhood was star-

ted by an explosion, and, when an examination was made, the boiler house was found to be wrecked and the boiler gone. Two hours later it was discovered in the rear of No. 441 Sixth avenue, something like 200 feet from where it belonged. It was unbroken, and had fallen on its end after its long flight over a number of tall buildings.

As the gate which the engineer locked was found to have been tampered with and the kindling wood was missing, it was suspected that some one had taken refuge in the boiler house, or entered it maliciously, and had fired up leaving the furnace doors closed on going away. The two steam gauges, which fell through a skylight two blocks away, registered 70 and 80 pounds respectively.

Prosperity in the United States.

Our country is in a prosperous condition. There is no doubt about it. Our manufacturers, merchants, bondholders, bankers, mechanics, all admit it, and the statistical returns from National and State authorities, and from the commercial agencies, add further testimony to prove that we are now in the felicitous position of being the most prosperous nation in the world, and have got a right to rejoice over it as loudly as we please. The total number of failures in the United States during the year 1880 were 4,735, with liabilities to the amount of \$65,752,000. The failures in 1879 were 6,658 in number, with liabilities of \$98,149,053, and in 1878 the failures numbered 10,478, with liabilities of \$234,363,132. This shows that the number of failures is rapidly decreasing. Statistics also show that the number of persons and firms engaged in business in the United States in 1878 has increased about ten per cent. The stock of precious metal has been increased during the year 1880 by home production and by importation to the extent of \$250,000,000. This large increase in available currency has undoubtedly inflated prices and greatly stimulated the spirit of speculation. There are of course many of a pessimistic turn of mind who think this condition of prosperity is too good a thing to last long, and are lustily crying out a warning to "look out for breakers ahead." Others more optimistic in their views answer that we can stand prosperity for a good length of time yet, and anyhow that there is no use in trying to cross a bridge till we get to it.

The Increased Demand for Maize Flour.

The consumption of maize (which we almost universally designate corn) in England is yearly increasing. In Germany, millers have used successfully an admixture of 25 per cent of maize flour with rye flour. It is undoubtedly sold as *straight rye* to the consumer. The German rye crop for 1880 was considerably larger than in 1879, but it has also been found necessary, to supply the demand, to import annually large quantities from Russia, which imports in 1879 amounted to 28,591,461 centners of 110½ pounds, against exports for the same time of 2,960,553 centners. Holland millers use as high as 33½ per cent of maize or corn flour for admixture with rye flour. They claim that a pound of maize flour only costs half as much as a pound of wheat flour, and yet furnishes nearly as great an amount of nutriment. Now that foreign millers and dealers have got into the practice of using corn flour, it seems probable that the demand for American corn will rapidly increase, and to such an extent, perhaps, that the demand for our wheat and wheat flour at good prices will be materially interfered with. There is said to have been a firm demand at good prices for all the American corn flour that has been shipped.

There were many excellent samples of corn flour on exhibition at Cincinnati in June, 1880, and they were closely inspected by many of our foreign visitors. We were informed then that corn flour was used in different parts of Europe, to a considerable extent, for adulterating wheat flour, to meet a popular demand for cheap flour.

Sweden like Germany has adopted a protective tariff on breadstuffs. The bill establishing this tariff was supported by a party similar to our granger party here, which was strong some time ago, and having passed the legislature, has been signed by the King. The production of cereals in Sweden for 1880 was as follows:

Wheat	455,000 tons.
Rye	4,536,000 "
Oats	11,614,000 "
Barley	3,642,000 "
Grain for feed	1,307,000 "
Peas	423,000 "
Beans	47,000 "
Lentils	165,000 "

22,424,000 "

Vale!

O the swift years!
Pleasure, dismayed, beholds them hurry on;
And love, strong love, looks back through passion-
ate tears;
Like the bright meteor that scarce appears,
Soon are they gone.

O the fleet hours!
Why, what is man?—their puppet and their slave;
At first his fetters wreathing with fair flowers;
Then galled and worn and robbed of all his powers,
Gaining a grave.

Vale! we cry,
Watching in youth the sweet June roses fall;
They bloom again—small matter if they die.
Ah! yes, they bloom; but canker worms will lie,
Doubt not, in all.

Vale! The word
Later has smitten us with mortal pain;
Rung out the death-knell of dear hope, or stirred
The lips whose earthly voices may be heard
Never again.

Then does it wake
Sad recollections; haunting thoughts that grieve
We know the cruel wounds some farewells make,
We learn to dread the nothingness, the break
Parting may leave.

So the years run!
Vale! we soon must bid this brief estate;
But for that heritage which shall be won
When the freed soul with time itself has done
Trusting, we wait.

—The Argosy.

A Terrible Ride.

ONE HUNDRED AND TWENTY MILES IN A STAGE COACH AT FORTY BELOW ZERO.

[Letter from Chief Justice Wade, of Montana, to Judge McKinney, of Cleveland.]

HELENA, Montana, Jan. 2.—*My Dear McKinney*—I arrived here on the evening of December 29, and I must give you an account of my winter journey. We arrived at Dillon, Montana, the terminus of the Narrow-gauge Railroad, on the evening of the 26th of December, and prepared to start on the stage coach for Helena—distance 120 miles. During the night it became quite cold, the thermometer being 15° below zero when we got on to the coach in the morning. As we went along the cold increased, and soon the four horses were as white as snow with frost. Arriving at the first station, fifteen miles away, the horses were changed for others, and on we went. Very soon it commenced to snow and the wind to blow a hurricane. A terrible storm was upon us, and the thermometer went down to 30° below zero. There were three passengers besides myself, one lady.

At noon we arrived at a station called Salisbury, and had dinner. The storm raged with great fury; we were in a wide valley, and there was nothing to obstruct the wind. The snow was as hard and fine as very small shot, and it pelted in the horses' faces, almost blinding them and the driver, but on we went, reaching the second station from the dinner station at 4 o'clock. Here the driver lighted the lamps at the side of the coach, and we all prepared for a night ride to the next station, sixteen miles away, where we expected to remain for the night. I heard the driver say to the stableman who took care of the horses, he did not much expect to reach the next station, but thought we should be lost in the storm. We were still in a wide valley, covered with snow, with scarcely a house to be seen anywhere, and with no landmarks except the mountains in the distance, and these the storm almost obscured.

We started out and very soon it was totally dark, the storm still howling with great fury and the cold having increased. We had proceeded but a little way when the driver lost the road. The snow and the storm had blotted out every appearance of a road, and the pelting snow and the fierce wind made it almost impossible to look for one. My whiskers and eye-lashes had become a solid mass of ice while riding in the coach. The driver cried out that he was lost, and asked some one of the passengers to take the side-lamp of the coach and go forward and look for the road. It was all he could do to keep the horses in order. I volunteered to go, and went out to search for the road. The snow was knee deep, and it was impossible to face the storm. The pelting snow seemed to take the skin off every time it struck. I wandered around in the snow searching for a road, and finally found it, and called to the driver to come on.

This I did for a long time, until completely worn out and exhausted I had to go into the coach and rest, and one of the other passengers took the lamp and went ahead of the horses, searching for the road. I found after I got into the coach that both of my ears and my nose were frozen stiff, and that my fingers holding on to the heavy iron lamp were also frozen. The second fellow that went out was a failure. He would not face the storm, and every few rods would find him walking with the storm. The driver called lustily for me,

and I went out again, but I soon lost all traces of the road. The prairie was as pathless as the ocean.

Oh, how the storm raged! It seemed greedy to find something upon which to wreak its vengeance. I could not find the road. The driver thought he could, and asked me to take care of the horses while he made the effort. I stood at the head of the horses. A fierce gust of wind took my hat and carried it out of sight in an instant. I borrowed another from a passenger. The driver was equally unsuccessful. Could not find the road. We were lost. The situation was full of peril. To remain in the coach all night was full of danger, for the cold was sufficient to freeze us, and to wander about in the snow in search of a road which would do us no good when found was equally dangerous.

Finally the driver thought it best to try and follow the back track to a certain hill and there make an effort to find another road which branched off from the hill but also arrived at the station. We turned around, but all traces of the back track had disappeared. We searched for the hill an hour and finally found it; but the other road was equally obscured. I could not walk any farther; my legs refused to go and I got up with the driver and we felt our way along by the side lamps, not attempting to follow or to find the road. After going in this way about an hour, we came to a fence. The driver knew this for they are a great rarity in this country. He also knew that there was another fence half a mile away, and if we could find the second fence, we should be within a half a mile of the station. We searched for the second fence for an hour, and at last found it, and then in a short time blundered on to the station. I do not think a fellow was ever happier to find a stage station than I to find that one.

This station is sixty miles from Helena, and the coach from Helena, due there in the evening, did not arrive until 2 the next day. We reached the station at 12.30 o'clock at night, having wandered on the prairies eight hours, lost in the storm. I went to bed in a room with an inch of snow on the floor, and it was almost as uncomfortable as being out in the storm. I believe I would much rather freeze out on the prairie than in bed.

We concluded not to take another night ride, especially as we had to go over two ranges of mountains to reach Helena, and so let the coach that came in that afternoon start back without us. It was well we did, for it was from 3 o'clock in the afternoon until 3 in the morning in going seventeen miles.

The day we remained at the station the coach came down from Helena on runners, and the next morning we started in this open sleigh for Helena, the thermometer standing, when we left, forty degrees below zero. We had six good horses and not much load. The snow was two feet on the level, but we could follow the track it made the day before in coming down to the station. Soon we passed over the boulder range of mountains. Besides the mountains always there, we found mountains of snow. It seemed as though the earth was wrapped in its everlasting winding sheet. The day was still and clear. The silence of the mountains was oppressive. It seemed as though the earth was dead.

Helena at 6 o'clock in the evening, the thermometer standing when we arrived at thirty degrees below zero, and went down to forty below before morning. I found the town buried in snow. I have been here ten years and never saw anything like it.

The Velocity of Light.

It has been ascertained by several independent methods, that light moves at the rate of 192,500 miles per second. One method is by means of the eclipses of Jupiter's satellites. To render this mode intelligible to those who have not studied astronomy, it may be premised, that the planet Jupiter is attended by four moons which revolve about their primary, as our moon revolves about the earth. These small bodies are observed, by the telescope, to undergo frequent eclipses by falling into the shadow which the planet casts in a direction opposite to the sun. The exact moment when the satellite passes into the shadow, or comes out of it, as would be seen by a spectator at the mean distance of the earth from the sun, is calculated by astronomers. But sometimes the earth and Jupiter are on the same side, and sometimes on opposite sides of the sun; consequently, the earth is, in the former case, the whole diameter of its orbit, or about one hundred and ninety millions of miles nearer to Jupiter than in the latter. Now it is found by observation, that an eclipse of one of

the satellites is seen about sixteen minutes and a half sooner when the earth is nearest to Jupiter, than when it is most remote from it, and consequently, the light must occupy this time in passing through the diameter of the earth's orbit, and must therefore travel at the rate of about 192,000 miles per second.

Another method of estimating the velocity of light, wholly independent of the preceding, is derived from what is called the *aberration of the fixed stars*. The full explanation of this method must be referred to astronomy; but it may be understood in general, that the apparent place of a fixed star is altered by the motion of its light being combined with the motion of the earth in its orbit. It will be remarked that the place of a luminous object is determined by the direction in which its light meets the eye. But the direction of the impulse of light on the eye is modified by the motion of the observer himself, and the object appears forward of its true place. The stars, for this reason, appear slightly displaced in the direction in which the earth is moving; and the velocity of the earth being known, that of light may be computed in the same manner as we determine one component, when the resultant and the other component are known. The velocity of light has been determined also by direct experiment, in a manner somewhat analogous to that employed by Wheatstone for ascertaining the velocity of electricity.

A Middlings Purifier Patent.

On the 28th day of December, 1880, a middlings purifier patent was granted to George T. Smith, the gentleman so well known to the milling trade from his interest in middlings purifier patent suits. The application for this patent was filed Nov. 2, 1880, being a division of an application filed Jan. 4, 1873, the original application having been filed July 12, 1871. For the information of all interested we quote the claims which form part of the specifications of the patent granted, and which appear to be exceedingly broad.

THE CLAIMS.

1. The combination, in a middlings purifier, of a reciprocating screen clothed with cloths of different degrees of fineness, a fan for causing air-currents to pass upward through the screen, and the chest which encloses the screen and forms an air-trunk, by which the air entering below is directed through and escapes above the screen through a contracted tubular discharge, and provided with apertures which are made of different areas opposite the various sections of the screen, for the purpose of regulating the force of the current through such sections substantially as set forth.

2. The combination, in a middlings purifier, of a reciprocating screen clothed with cloths of different degrees of fineness, a suction-fan placed above the screen, a chest which incloses the screen and forms an air-trunk between the air openings below and the fan above the screen, and adjustable openings placed opposite the different sections of the screen, whereby the force of the current may be regulated according to the texture of the cloth and material to be treated, and the material raised by the fan is carried away through the tubular mouth of the fan-case, substantially as set forth.

3. The combination, in a middlings purifier, of a fan and reciprocating screen clothed with cloths of different degrees of fineness, a chest which incloses a screen and forms an air-trunk, causing the entire current to pass through the screen, and constructed with transversely-elongated and adjustable openings extending across the cloth, so as to equalize the action of the atmospheric currents upon the material traversing the sieve, substantially as set forth.

4. In a middlings purifier, in combination with a suction-fan and reciprocating screen clothed with cloths of different degrees of fineness, a chest forming a portion of a continuous wind-trunk inclosing the screen, and auxiliary wind-trunk connecting the fan with the interior of the chest through a series of openings of different areas placed opposite to the different sections of the bolting-cloth, substantially as set forth.

5. The combination, in a middlings purifier, of a reciprocating screen clothed with cloths of progressively coarser mesh, a fan for causing an air-current through the screen, a chest which incloses the screen and forms part of a continuous wind-trunk to conduct the air put in motion by the fan through the entire extent of the screen, and controlling its delivery after it has passed through the screen, and a contracted tubular air-discharge, whereby a film of middlings is subjected to a current or air uniform across the width of the screen and

continuously increasing in force as the residuum becomes continually coarser and the cloth proportionally increases in coarseness of mesh, substantially as set forth.

6. The combination, in a middlings purifier, of a screen having cloths of different degrees of fineness, a fan, and chest which incloses the screen and directs the air-currents through the entire series of cloths, while the middlings pass from the finer to the coarser sections, a hopper which collects the middlings as they fall through the cloths, and a conveyer and slide for remingling the middlings from two or more cloths after they have separately passed through cloths adapted to their several sizes, substantially as set forth.

Jay Gould.

JAY GOULD is forty-five years old, but looks younger. There is a slight tinge of gray upon his black beard, and his high, full forehead and sharp, dark eyes attract notice. His friends say that within a year or two he has changed his method of doing business, when he used to manipulate stocks altogether. They say he is now exclusively engaged in the establishment and management of great telegraph and railway enterprises. But it won't do to rely wholly upon the apparent stillness of the man who holds the stock market by the throat, and can choke shekels out of it whenever he happens to be in the mood. Some twenty years ago Mr. Gould married a Miss Miller, whose father was of the firm of Dater & Co., grocers. They have six children. Mr. Gould is eminently a man of habits. At the close of business he rides home, takes dinner with the family, and passes the evening in his study. In this room are the telegraphic operator and his private secretary. Private wires enable him to communicate with his broker and aids all hours of the day and night. No man works harder than he. Wine and tobacco are forbidden guests. Reading and looking at his magnificent pictures are his only recreations. He is a generous, open hearted, largely minded, unostentatious man. To his family Mr. Gould is devotedly attached. He rarely travels either for business or pleasure, unless accompanied by some of his children. They have anything and everything they want, and do just as they please. Mr. Gould is at all times the plainest of men.

A Disheartened Inventor.

It was in a smoking-car on the Hudson River Road. A New Yorker was exhibiting an invention to several gentlemen, when an old farmer, with a settled look of sadness on his face, heaved a sigh and said:

"I never see such things without wanting to weep."

"Nothing about the invention to weep over that I can see," replied the inventor.

"Wall, it sort o' calls up old recollections. Twenty years ago this month I thought I had a fortune in my grasp. Yes, sir; I believed I had struck the biggest thing since steam was brought into use."

"What was it?"

"One day when the old woman was flat down with her lame leg I had to cook my own dinner. After I'd got the pancake batter all fixed up I couldn't find the greased rag the old woman used to rub over the spider. Sort of absent-minded like, I picked up a piece of raw turnip from the table and used it instead. It worked to a charm, no smell, no smoke, no stick."

He paused here to wipe away a tear, and then continued:

"There was the fortune. I figured that 9,000,000 greased rags were in use in this country nine months in the year. Fifty thousand barrels of grease were used up greasing spiders. Over \$100,000 wasted and gone. One turnip would make six greasers—1,000 bushels would make enough to supply the country. All that was needed was to cut them out in fancy style, affix a handle, and go to supplying the demand at 10 cents each."

"There was money in it."

"No, there wasn't. I bought 100 bushels of turnips; \$56 worth of wire, and hired two men to go to work, and then I took some greasers and went over into Vermont to see how it would take. They wouldn't have it. They had something more simple and much cheaper."

"What could it have been?"

"They spit on the spider," replied the old man, as a tear made a break down his nose and was swallowed up in the dust on the floor.

Jas. Andrew's flouring mill at Mitchellville, Iowa, was totally destroyed by fire on the 6th inst. Loss, \$10,000, with no insurance.

NEWS.

EVERYBODY READS THIS.

ITEMS GATHERED FROM CORRESPONDENTS, TELEGRAMS AND EXCHANGES.

Lisbon, Dakota, is soon to have a flour mill.

E. W. Rising is building a mill at Davison, Mich.

J. E. Butler, miller at Santa Cruz, Cal., has made an assignment.

A. A. Perkins, of Webster, Penn., is building a four-run steam mill.

E. Andrews, of Lodi, Wis., has sold his mill to Messrs. Hackle & Seville.

Messrs. Hole & Bartley, have recently sold their mill at Hastings, Mich.

Des Moines, Ia., is to have a \$300,000 starch factory during the present year.

A new custom mill is being built at Moline, Mich., by Messrs. Bates & Anderson.

Robertson & Gregory's steam flour mill at Wahoo, Nebraska, burned January 2.

J. T. Shepherd, Harrisburg, O., is having his mill remodeled to the new process.

The Big Diamond mill at Morristown, Minn., is being changed to a 250 barrel roller mill.

A 250-barrel roller mill is to be built at Fergus Falls, Minn., by Messrs. Newcomb & Todd.

R. M. Sharp & Co., of Macon, Mo., are enlarging their mill and adding a few new run of buhrs.

The latest figures given place the cotton crop of the Southern States for 1880 at 5,900,000 bales.

The Prairie Mill Co. will build a 200 barrel roller mill at Barham, Dakota, on the N. P. R. R. this year.

A four-run water mill with all improvements up to date, is being built at Quincy, O., by Jacob Allinger.

Messrs. E. R. Hoyt & Son of Beaver Dam, Wis., are adding \$6,000 worth of improvements to their mill.

Dr. Trammell, of LaFayette, Ala., has made arrangements to build a large merchant flouring mill at that place.

A new flouring mill has recently been put in operation at Sagetown, Tuscola county, Mich., by Randall, Bros.

Hillyer & Bingham's mill near Mankato, Minn., (Red Jacket Mills) burned December 31st, 1880. Insurance \$9,000.

Thomas Ross, the inventor of the Howe scale, was recently killed by the bursting of an emery wheel at Rutland, Vt.

The mill at Kirklint, Ind., owned by Messrs. Hodges & Hinkle, is being metamorphosed into a fine four-run new process mill.

The Duluth elevator, having a capacity of 1,600,000 bushels, now has in store 1,400,000 bushels of grain, and still more is coming.

The Gadsen Mill Co., at Gadsen, Tenn., has contracted with Nordyke & Marmon Co., of Indianapolis, Ind., for a two-run steam mill.

Twenty-four cooper shops in Grand Rapids, Mich., turn out over 50,000 barrels a year, 150,000 of which are used by the three largest flouring mills.

December 30th the gristmill at Deerfield, Lenawee Co., Mich., burned, together with 600 bushels of wheat. Total loss. No insurance reported.

The total valuation of assessable property in New York city for the present year is fixed at \$980,789,939, an increase of \$38,209,639 over last year.

If the figures we have are correct the failure of Martin Stiff at Holly, Mich., is a rather bad one. The assets amount to \$910.85 and the liabilities to \$25,506.76.

Johnson Bros., of Boardman, Wis., are making extensive improvements in their mill at that place. They will add twenty-four set of rolls among other things.

Burned, January 3, the water power flour mill at Quosqueton, Iowa, owned by the Independence Mill Co., and operated by H. J. Northrup. Loss, \$10,000. Insurance, \$5,000.

The Western Insurance company of Milwaukee and the Phoenix of Brooklyn have paid in full their losses, amounting to \$2,500, on grain destroyed in Hayward's mill at St. Cloud, Minnesota.

G. S. Lewis, of Butte, Montana, is owner of the Union mills, which have a capacity of 50 barrels per day. It is driven by a small mountain stream. L. M. Howell was the former owner.

Messrs. Gay, Only & Co., of Mt. Sterling, Crawford County, Wis., have a neat 2-run water power custom mill, and produce daily about 25 barrels of flour and also grind considerable feed.

Uehling Bros' water power mill at Afton, Rock Co., Wis., has 3 run of stones and one set of Gray's rolls for flour, and one of Kaestners, portable mills for feed. Their flouring capacity is upward of 40 barrels per day.

The piston-rod of the steam engine in the Laclede flouring mills, owned by Kehlor Bros., St. Louis, recently (Jan. 17,) broke suddenly and burst out the cylinder head. No one was hurt although there were several narrow escapes. Damage about \$1,000.

White Bros. & Co., flour manufacturers of Hokah, Minn., have failed, and the business will hereafter be carried on by W. W. Cargill & Bro. The liabilities are said to amount to \$26,000. The value of the mill is \$20,000. It is mortgaged for half the sum. The bulk of their creditors are Eastern parties.

The flouring and planing mills of Underhill & Smith, at Brookport, N. Y., were burned on the 1st inst. The loss amounts to about \$3,000; building, \$2,500; stock, \$1,000; machinery, \$1,800; machinery in the grist mill, \$2,500. The insurance was \$1,300 on building, \$2,200 on stock and machinery, and \$1,800 on the grist mill.

Kansas harvested 25,000 acres of Egyptian or rice-corn last year, the average yield being twenty-five bushels to the acre. This corn was among Egypt's exhibits at the Centennial, and, as it thrives in the driest soil and under the intensest heat, and is preferred by cattle and fowls to Indian corn, its widespread introduction is predicted.

John Keyser has been committed to jail for sixty days at Washington, Minn., for stealing wheat checks belonging to the Mazeppa Milling Mill company. Keyser filled them out and drew the cash upon them at the mill. He was arrested for forging the checks, but was committed for stealing, he not having forged the name of the company.

The receipts and shipments of flour and grain at Peoria, Ill., for 1880, according to the report of the secretary of the board of trade, were as follows: Flour, receipts, 197,427 bbls.; shipments, 182,504 bbls.; wheat, receipts, 559,620 bu.; shipments, 546,775 bu.; other grains, receipts, 23,511,360 bu.; shipments, 19,206,990 bu. These figures show a considerable increase over the business of 1870.

A boiler in the Union flouring mills, Detroit, Mich., built by D. M. Richardson, exploded Jan. 12, and so badly destroyed the mill that it will have to be razed to the foundation walls. Albert Crosslin, the assistant engineer, and fireman Henry Shultz were instantly killed and two other men were injured. Three horses were also killed. The mill was owned by the J. N. Swain estate, and the loss is estimated at \$25,000.

Receipts of wheat at Philadelphia for 1880 were 11,076,250 bushels, against 20,079,600 in 1879, a decrease of 8,103,340 bushels. Corn receipts on the other hand, increased 5,096,900 bushels, the totals being 23,385,900 bushels for 1880, against 18,289,000 for 1879. The present stock in elevators is 1,215,059 bushels of wheat and 298,224 bushels of corn. The stock of flour in first hands at the close of last year was 129,200 barrels, of which 2,600 barrels were held by shippers and 2,000 barrels by speculators.

IMPORTANT NOTICE TO MILLERS.—The Richmond Mill Works and Richmond Mill Furnishing Works are wholly removed to Indianapolis, Ind., with all the former patterns, tools, and machinery, and those of the firm who formerly built up and established the reputation of this house; therefore, to save delay or misarrangement, all letters intended for this concern should be addressed with care to Nordyke & Marmon Co., Indianapolis, Ind. (Mention this paper when you write us.)

Situation Wanted

As miller by a single man, age 34, 18 years of experience. Is a good stonemason and accountant, is strictly temperate, and uses no tobacco. Address H. Y. Z., East River P. O., Cortland Co., N. Y. (Mention this paper when you write us.)

THE KING OF SAW MACHINES

Price \$9.00.

\$1000.00 IN CASH is deposited in bank against any other saw machine in America. This is the cheapest machine made, and warranted to saw logs easier and faster than any other. We are the oldest saw machine firm in America. Any prominent merchant will tell you we are responsible. Beware of infringements. Our circulars are free. Address, United States Manufacturing Co., Chicago, Ill.

Our WELL AUGERS will bore a well 75 feet deep and 2 feet in diameter in a day. This would clear you \$50 in a day. Send for our Pictorial Catalogue. U. S. MFG CO., Chicago, Ill.

FOR SALE CHEAP!

At Less than Half Cost.

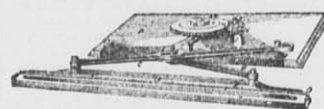
Six run of Violet and Old Stock 4 foot buhrs, in splendid condition, with spindles, trampots, curbs and every part complete, including Behn's exhaust, iron hurst frame and bed plates; also a No. 7 Sturtevant fan. Any party wanting this outfit can secure a great bargain, and if not sold in two weeks in one lot, will be offered separately. Enquire of CAHILL, FLETCHER & CO., Galaxy Mill, Minneapolis, Minn. (Mention this paper when you write us.)

FLOUR MILL FOR SALE.

Any one desiring to purchase a 4-run water power mill in a good wheat-growing country, four miles north of Dayton, Ohio, on the Stillwater River, CHEAP and on easy terms, will address MICHAEL SCHAEFER, 16 Market street, Dayton, Ohio.

SITUATION WANTED.

By April 1st, or sooner. A prominent miller; one who has been milling since 1856; had full charge of a large water mill 14 years, and head miller in steam mill 12 years. Is one of the finest burr dressers in the country. Reason for changing situation, his employer is trying to sell out, and he don't know what day he may be out of work. Please address LAWYER DONALDSON, Prosecuting Attorney, Allegan, Mich.



The undisputed success of the above machine by the universal satisfaction it has given has brought into existence numerous others of the like in principle, all having their respective advantages, and the subscriber is now furnishing Diamonds for all the Mill-Stone Dressing Machines in the market, with numerous cutting edges, at \$2 each and upwards. Diamonds sharpened. Send money with order to J. DICKINSON, 64 Nassau St., New York. (Mention this paper when you write us.)

DICKINSON'S PIONEER MILL-STONE DRESSER

Simple, Effective and Durable.

Price, with two large Diamonds.....\$50.00.

The undisputed success of the above machine by the universal satisfaction it has given has brought into existence numerous others of the like in principle, all having their respective advantages, and the subscriber is now furnishing Diamonds for all the Mill-Stone Dressing Machines in the market, with numerous cutting edges, at \$2 each and upwards. Diamonds sharpened. Send money with order to J. DICKINSON, 64 Nassau St., New York. (Mention this paper when you write us.)

C. C. PHILLIPS,

MANUFACTURER OF

VERTICAL and HORIZONTAL

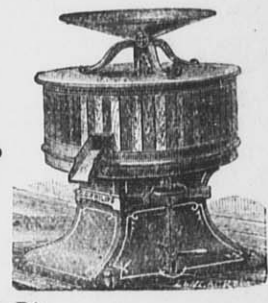
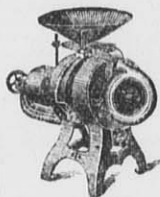
French Burr Mills.

GREATLY IMPROVED.

Adapted to all kinds of Grinding.

Send for circular before purchasing elsewhere.

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PARIS INTERNATIONAL EXHIBITION OF 1878.

Six Awards obtained, including Two Gold Medals and the Decoration of the Legion of Honor.

J. HIGNETTE, Constructing Engineer,
162 and 164, Boulevard Voltaire, Paris, France.

Sifter and Stone Clearer,
FOR CLEANING GRAIN.

Over 2,000 of these machines have been made up to the present time.

Sorel's Cement for Repairing Millstone

Sample Boxes sent on receipt of Post-office order for 4s. (81).

COMPLETE SYSTEM OF GRAIN CLEANING FOR MILLS.

FLOUR AND RICE MILLS, BAKERIES, and STARCH WORKS

Fitted up complete with every requisite.

SPECIAL MACHINES FOR DECORTICATING AND PEARLING CEREALS.

Millers in America are invited to send for our catalogues. (Mention this paper when you write us.)

M. F. PERRY,

(Successor to C. B. Oglesby & Co.) Manufacturer of

The "Convertible" Portable Mills

PATENTED 1877. Many of these are now in use on Middlings, Corn Meal, Graham Flour, Acorn-meal, Feed, etc., giving the best satisfaction. There are four different sizes: 12 in., 16 in., 20 in., and 24 in. diameter of French Burr. The most convenient, durable, light-running and economical Burr Mills in the market. Adapted to all classes of grinding. The Silver Creek Smut Machines. Excelsior Boiling Cloth, the best in the market. Flower's Patent Lubricator for Engine Cylinders, Engines, Boilers. New and Second-hand Machinery. M. F. PERRY, 43 S. Canal St., Chicago, Ill.



(Mention this paper when you write us.)

"THE GREAT ROCK ISLAND ROUTE"

Calls your attention to the following REASONS WHY, if about to make a Journey to the GREAT WEST, you should travel over it:

As nearly absolute safety as is possible to be attained. Sure connections in UNION DEPOTS, at all important points. No change of cars between CHICAGO, KANSAS CITY, LEAVENWORTH, ATCHISON or COUNCIL BLUFFS. Quick journeys because carried on Fast Express Trains. Day cars that are not only artistically decorated, but furnished with seats that admit of ease and comfort. Sleeping cars that permit quiet rest in home-like beds. Dining cars that are used only for eating purposes, and in which the best of meals are served for the reasonable sum of seventy-five cents each. A Journey that furnishes the finest views of the fertile farms and pretty cities of Illinois, Iowa and Missouri, and is afterwards remembered as one of the pleasant incidents of life. You arrive at destination rested, not weary; clean, not dirty; calm, not angry. In brief, you get the maximum of comfort at a minimum of cost.



That the unremitting care of the Chicago, Rock Island & Pacific Railway for the comfort of its patrons is appreciated, is attested by its constantly increasing business, and the fact that it is the favorite route with delegates and visitors to the great assemblages, political, religious, educational and benevolent, that assemble from time to time in the great cities of the United States, as well as tourists who seek the pleasant lines of travel while en route to behold the wonderful scenes of Colorado, the Yellowstone and Yosemite. To accommodate those who desire to visit Colorado for health, pleasure or business, the Company every year puts on sale, May 1st, at all Summer season and months of September and October, the Company every year puts on sale, May 1st, at all coupon ticket offices in the United States and Canada, round trip tickets to

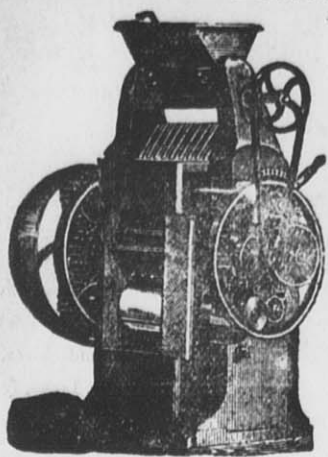
DENVER, COLORADO SPRINGS and PUEBLO. At reduced rates, good returning, until October 31st. Also to San Francisco, for parties of ten or more, good for ninety days, at great reduction from regular fares. REMEMBER, this is the most direct route for all points WEST and SOUTHWEST. For further information, time-tables, maps or folders, call upon or address

R. R. CABLE, Vice-Prest and Gen'l Man'gr, Chicago. (Mention this paper when you write us.)

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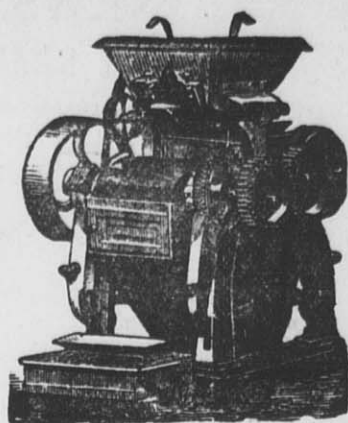
VIENNA EXHIBITION. 1873, Awarded Diploma of Honor.

PARIS EXHIBITION, 1878, Awarded 2 Gold Medals and 1 Silver Medal.



GANZ & CO., Iron Foundry and Manufacturing Association,

Buda-Pesth, Hungary; or Ratibor, Germany.



We take this method of recommending to the American milling public our PATENT ROLLER MILLS with chilled cast iron rollers, for crushing and grinding wheat, which have met with such eminent success in Europe. The mill-owners of BUDA-PESTH, as well as the prominent millers of Austro-Hungary, and a large number in Southern Germany, Switzerland and England, have provided for their mills the celebrated GANZ ROLLER MILLS, which are about to supplant entirely grinding on mill-stones, their working being more perfect, producing more white flour, requiring less power than the best mill-stone, and wanting no repairs excepting to occasionally replace a bearing. We have introduced into the art of milling these Roller Mills with chilled cast iron rollers, and from 1874 to January, 1879, we have delivered in the different European countries, Africa and the United States of America about 2,100 mill, and all work satisfactorily. Our crushing mills may now be regarded as absolutely necessary for every well-furnished modern mill, and this is proven by the numerous testimonials at hand. Our grinding mills are remarkable for their absolute discharge bearings, by means of the newly-devised Anti-Friction Pressure Rings. These Rings allow a very high pressure, and hence assure the performance of a great deal of work, avoiding all waste of power caused in other machines by friction in the bearings.

Out of numerous testimonials at hand we select the following:

BUDA-PESTH, March 28, 1878.—To Messrs. Ganz & Co., Foundry and Engineering Co., Limited, Buda-Pesth: Complying with your request to communicate to you my experience with your Roller material, I have pleasure in stating that I consider it, i. e., your generally well-famed chilled iron, as the best within my experience, and its adoption has satisfied me in every respect, so that I do not hesitate to assert, by introducing it on a large scale, you have rendered a considerable service to the milling art. Your material is equally well adapted for rough grinding, softening or grinding. Owing to its great hardness I cannot characterize it otherwise than indestructible. The grooved crushing rollers have demonstrated this hardness, as also a toughness, of your castings in a manner which astonishes all who know the rapid wear of cutting edges used in the treatment of grain. Your smooth rollers, once properly ground, preserve their complete cylindrical form, and do not require any repairs for a period which even now cannot be estimated. They acquire, soon after being put to work, a finely-gritted surface texture, eminently adapted for grinding as well as for drawing down the meal, a condition which they preserve without change. It is quite superfluous to prove that there can be absolutely no question of discoloring unless with reference to new rollers, to which some remnants of oil, emery or other matter may yet adhere. The flour produced by your Chilled-Iron Rollers is very lively and has remarkable baking qualities. While stating the above to the best of my conviction in answer to your inquiry, I seize with pleasure this opportunity to express to you my thorough approbation, not only of your roller material, but also generally of your roller mill construction. Your rough grinding (cracking) with chilled-iron roller mills constitutes such an essential step in advance as compared to the rough grinding with stones, that they cannot fail to win their way into every well-built mill, working on the high or half-high grinding system. For the purpose of reduction to flour you have lately erected a form of mill which I consider extraordinarily successful. You have by the introduction of an entirely new mechanical organ, i. e., the Rotary Anti-Friction Spring Pressure Ring, solved the problem of discharged bearings, which has so often been raised and as often dropped again unanswered. You have achieved success with decided aptitude in a manner as wonderful as it is simple and practical. This Roller Mill absorbs, in fact, only just the power required for the reduction into flour, and none for bearing friction which, usually, as is well known, amounts to a high figure. This Flour Mill receives an agreeable and light form while attaining a capacity hitherto unknown. In handing you the above communication for use as you may deem desirable, I remain, etc.,

(Signed) C. HAGENMACHER, Director of the First Ofen-Pesth Steam Mills.

TIVOLI KUNSTMUEHLE, Munich, April 5, 1878.—To Messrs. Ganz & Co., Engineers, Buda-Pesth—Dear Sirs: In reply to your esteemed of March 28, we have pleasure in testifying to our satisfaction with the Chilled-Iron Rollers

Address all communications to

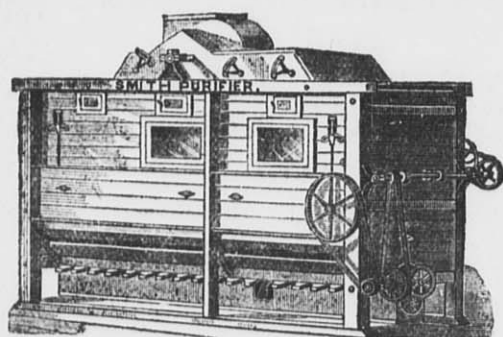
GANZ & CO., Buda-Pesth, Hungary.

Cable Address "GANZ, Kaiserbad."

Or GANZ & CO., Ratibor, Germany.

Or THROOP GRAIN CLEANER CO., Auburn, New York.

[Mention this paper when you write us.]



SIMPLE, DURABLE, ECONOMICAL. Cheaper than any other of equal capacity. Licensed under all patents owned by Consolidated Middlings Purifier Co. Eight sizes single and three sizes double machines.

THE GEO. T. SMITH MIDDINGS PURIFIER

Was awarded THE HIGHEST PRIZE ever offered for the competition of milling machinery—THE LOCKWOOD MEDAL—at the great Exposition. Competition and comparison with every other known Purifier only established it more firmly in the esteem and approval of millers and mill-owners.

It was UNANIMOUSLY awarded the FIRST PREMIUM in its class by a jury of five of the ablest, most successful and experienced mill owners in the United States, men who represented the milling of every variety of wheat, and the use of all the latest and most approved methods of new process and gradual reduction milling.

Our sales during the Exposition aggregated OVER ONE HUNDRED MACHINES, for every part of the country and for work on all kinds of stock.

We invite particular attention to our SPECIAL machines, combining in one all the features of both air and sieve Purifiers, perfectly adapted to handle and purify the breaks of roller mills.

Write for descriptive circular and price list to the

GEO. T. SMITH MIDDINGS PURIFIER CO., Jackson, Mich.

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SMITH BROTHERS, Practical Millwrights.

Plans, Specifications and Estimates made for all kinds of

MILLWORK, MACHINERY, Etc., Etc.

Flour, Sawmill, Tanners' and Brewers' Machinery, and General Mill Furnishers.

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THE LOCKWOOD MEDAL, "Awarded to the Geo. T. Smith Middlings Purifier, as the machine marking greatest progress and utility in its application to the grain and milling interests, invented within the last ten years."
Miller's International Exhibition, Cincinnati, Ohio, 1880.



FLOUR MILL FOR SALE.

Anyone desiring to purchase a 3-run Mill, driven by two water wheels, in a good neighborhood, and suitable for custom or merchant work will, address

A. C. BURNETT,

Maquon, Knox Co., Ill.

[Mention U. S. MILLER when you write.] dec

German and Austrian FLOUR MILL DIRECTORY.

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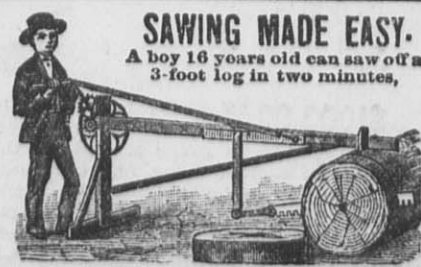


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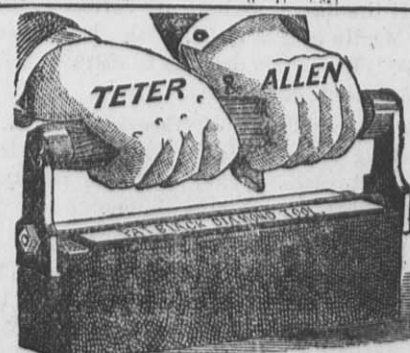
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